

THE IRON AGE

New York, June 13, 1918

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Preparedness

1. Since the Koppers Company was acquired by American owners, January 1, 1915, it has placed in operation 16 by-product coke plants, totaling 1810 ovens and 30 benzol plants. Between now and September 1, 1918, it will put into operation seven (7) additional coke plants totaling 1490 ovens and ten (10) additional benzol plants, making a total of 3300 ovens and 40 benzol plants placed in operation in three years and eight months—an average of one benzol plant per month and one coke plant every two months since the first one was placed in operation.

2. The total annual production of coke and by-products from these plants will be:

Coke	15,700,000 net tons
Tar	160,000,000 gallons
Sulphate of Ammonia .	266,000 net tons
Benzol	54,000,000 gallons
Toluol	17,700,000 gallons
Surplus Gas	109,000,000,000 cubic feet

with a total annual value at present prices of approximately \$187,000,000.

3. Of this amount the annual savings through the use of Koppers' plants as compared with bee-hive ovens totals \$90,000,000. The performance of these plants that are now in operation is such as to demonstrate beyond dispute that Koppers' present practice leads the world in the manufacture of coke and its by-products.

4. The Company is stronger today and is better prepared than ever before to execute rapidly a large volume of work.

H. KOPPERS COMPANY
PITTSBURGH, PA.

THE IRON AGE

New York, June 13, 1918

ESTABLISHED 1855

VOL. 101 : No. 24

Sidelights on Winchester Gun Production*

Control of Tools and Gages—Foremen
Held Responsible for Inspection—Time
Study Methods and Satisfactory Results

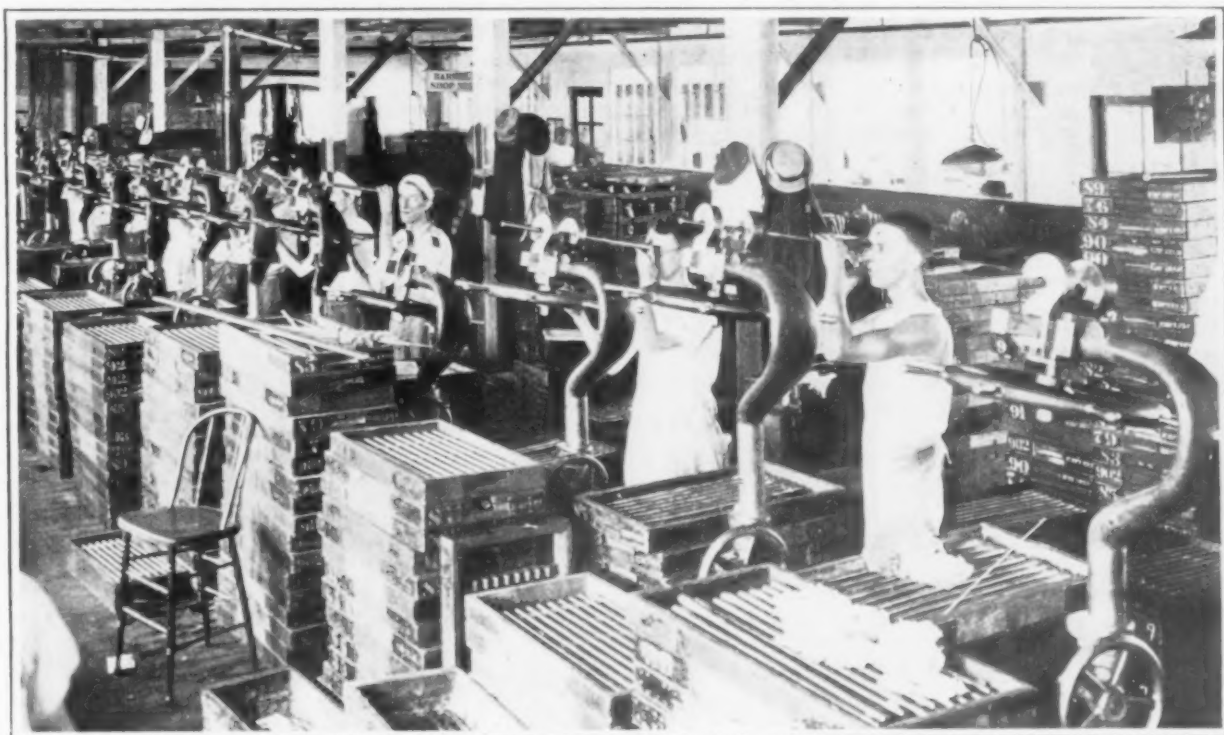
BY W. E. FREELAND

ONE of the two chief production departments of the Winchester Repeating Arms Co. is the gun department. It is divided into 42 shops, employing more than 6000 people. Its output consists of the sporting rifles and repeating shot guns for which the company has long been widely known, the riot guns which are a favorite weapon of city police forces and the guards of munition plants, the modified Enfield rifles now being used by the United

takes a somewhat different form because the gun department is essentially a series of big machine shops and the details of the functional work have been fitted to the tasks created by the more involved mechanical processes.

Work of Preparation Section

The big task of the preparation section is to provide and control the production tools of the depart-



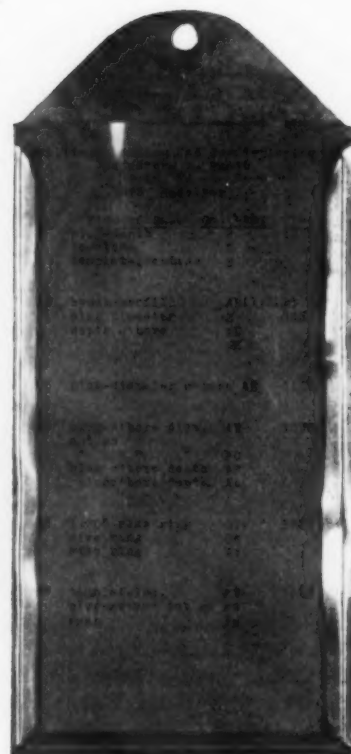
The Machines Here Used for Straightening Rifle Barrels Have Increased Output

States army, and the new Colt-Browning automatic machine rifle, of which the company is at this time the principal producer.

Its organization is molded to conform to the functional system that is standard throughout the plant and differs only in minor points from the organization of the cartridge department which has been described. The work of the functional staff

ment. From 80 to 85 per cent of the work on production tools used in the gun department is done by the tool department, the remainder being done in the tool shops of the gun department. On account of the many variants which arise in the work of the adjusters in the gun department, it is not possible to carry the manufacture of the tools far beyond this percentage when the work is done on a manufacturing scale in the tool department. The gun department has, also, a tool room of its own in which are made tools for small lots of special models of guns or what might be termed job orders

*A number of articles on the organization and management of the Winchester Repeating Arms Co., New Haven, Conn., has been published in these columns this year. They appeared in the issues of Jan. 3, Jan. 17, Jan. 24, Feb. 21 and March 7.



Each Adjuster Is Furnished with a Complete Tool Kit, Which Is Kept in a Locked Box. A list of the tools in the kit is attached to the inside of the cover and each tool bears the number of the kit box

in distinction to the manufacturing orders which are placed with the tool department. This smaller shop is also well equipped to take care of emergency work in which special speed is desirable. The final grinding of the tools is done in the manufacturing shops when the fixture is adjusted to the machine and the work gaged.

The preparation section of the gun department, in conjunction with the engineers, is carrying on an extensive work in the standardization of tools, which is one of the results of centralization of tool preparation in the hands of one responsible man and his assistants. In former times it was customary to use a tool usually only on a single operation but now a tool is frequently used upon a number of operations. This reduces the number of styles or kinds of tools and enables the preparation section to place larger orders on the tool department and effects a considerable economy in production cost.

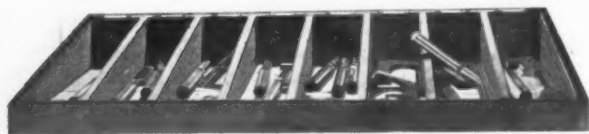
All tools, fixtures and gages are delivered by the tool department to a central tool cage in the gun department. This central tool cage is equipped with steel racks and each fixture has its own rack location, the fixtures being grouped by model and style. Much the same system is applied to tools and gages. The clerical and indexing work is thorough but requires only a few people to do it. Shop tool cages are scattered about in strategic points in the various rooms of the gun department and the system in these shop tool cages partakes of the same thoroughness and simplicity that characterizes the work in the central tool cage. The central tool cage gets all the fixtures for a job and delivers them to the shop tool crib. A loan card is placed

on the rack in the central tool cage from which the fixture has been taken. Besides the central tool cage, the preparation section has another large storage room in which are placed the hundreds of dies which are used for forged parts, bayonets, etc. Tool kits are issued to adjusters in a standard crib which has been devised to hold a full equipment compactly. The use of this crib makes it easy for the adjuster or overseer to check up the tools in each kit.

System of Gage Control

The adjuster is held responsible for the particular operation the gage is intended for. The gages are placed in trays and each adjuster is given a requisite number of trays to hold his gages. Each tray bears a different symbol and each compartment in the tray carries a different number. For example, tray A has compartments numbered 1 to 8; tray B, from 9 to 16, etc. The same symbol or number appears on but one tray throughout the entire gun department. The gages, as they are located in the trays, are listed and the model, part, operation number, operation, symbol or number of the gage, and the kind of gage it is, as well as the tray letter, location and adjuster's name are noted. A typed card, mounted in a tin frame, shows a complete list of all the gages in a particular tray and this card is given to the adjuster to whom the tray is charged. This stays in the possession of the adjuster and new gages are added to the list as they are delivered to the shop. This card is the adjuster's index to his gages as well as the list used by the checker each night. The information found on it is typed on another card which is made in duplicate. One copy is filed in the office of the preparation section and the other in the shop with the preparation overseer.

When new or additional gages are delivered to the shop from the storeroom they are turned over to the preparation overseer who, after locating where they are to be used, charges them to the adjuster, locates them and lists them on a card. He



One of the Trays That Contain an Adjuster's Equipment of Gages

then sends a notice to the preparation section with the full information required for a third card. This information is checked by the preparation section and if complete the third card is made out and filed. A duplicate of this card is filed in consecutive order of symbol or number behind guide cards which designate the models and parts. As a means of checking the information given by the preparation overseer, the gage orders for new and altered gages are sent to the preparation supervisor each day by the gun tool central cage, which also furnishes a list of all gages drawn from stores each day.

At five minutes before closing time each day, checkers assigned by the preparation overseer go to each tray, check the gages and place them in the gage truck which is provided. After all collections are made this gage truck is placed in the tool crib. If any gages are missing, the inspector, if he cannot immediately locate them, makes a report to the preparation overseer. The latter, if he cannot find the gage by the next work day morning, reports the loss to the preparation section, giving full details as to who is responsible. Further search is then made and if the gage cannot then be found the preparation supervisor takes whatever action is necessary.

Each adjuster charged with gages must be able at all times either to produce the gage when required or show a loan card for it. Should an adjuster desire to use another adjuster's gage, he makes out a loan card and gives it to the latter who holds it until the gage is returned to him, which must be before the close of the same day. Should a gage be borrowed for use in another shop or withdrawn for alterations, the request or order must go through the hands of the preparation overseer who issues the necessary loan card to the adjuster in charge of the gage.

Inspection in Gun Department

The system of inspection formerly employed in this plant was to have central inspection points for partially or wholly finished products. With this remote inspection there was little control during production and the machine shops were not well informed of the faults that were found. One result of this was that a larger amount of work was spoiled than is now the case. The old inspection system was a more or less despotic rule and caused considerable friction at times.

When the new management took hold of the work in the gun department, a new order was introduced, reversing the traditional methods of inspection in such work. As now carried on, the foremen are held responsible for quality as well as for quantity. At first this new idea met with some



The Gages in Use in Each Shop are Collected at the Close of the Day, Deposited in the Proper Trays or on the Lower Shelves of This Truck After the Adjuster's List is Checked, and are Conveyed to the Shop Tool Crib for Safekeeping.

scepticism but the whole working force has been converted to the new doctrine.

The old method of central inspection was broken down by degrees and now there is a combination of field and station inspection. An average throughout the plant now shows about three stations and a final inspection station for each shop. A large number of girls are employed in station inspection and final inspection and, differing from the old practice, a division of work has been introduced so that except on the simplest components one girl does not gage the whole of a finished part but uses only one or two gages, passing the work along to a neighbor who carries the inspection forward. On Government work there is no final shop inspection of assembled guns, the final inspection being done by Government inspectors at a point remote from the machine shops.

Field inspection has two functions: First, to check the quality; second, to see that work that can be made to go is not scrapped. It is employed where the piece being worked upon is of considerable value and also where the volume of product of each machine hour is large. Station inspection is used where the money value and the hourly production is small. The value of and probability of making scrap is to a considerable extent a determining factor.

Station inspection is always done where suc-

Symbol	Model	Part				
F	1873	Receiver				
Kind of Gage plug-depth ga.						
Operation 5. Drill hole in						
bottom, front and rear	1/11/18	EG	1527	DG2R		
ends to facilitate rough						
milling for Trigger Guard						
and Magazine Tube						

Adjuster	Class	Shop	Comb.
J. Smith	Drilling, Reaming & Boring	DG2R	EG

Model	Part	Gage Symbols
1873	Receiver	F D E AH(I plug) 2
		AE AD GS AB AC AF
		AA AN AR AM GV GN
		EX

Forms Used in the Control of Gages

GUARANTEE OF RATE PER 100		
GUN "B"	SPRING SIGHT BACK	17
13	Finish rear screw hole (Groable Spring Steel)	
Ireland Gifford Machine		\$0.035
THE COMPANY GUARANTEES THE ABOVE RATE FOR THIS OPERATION AS LONG AS THE METHOD DESCRIBED ON THE INSTRUCTION CARD IS IN EFFECT		
WINCHESTER REPEATING ARMS COMPANY		
1917-18 4-27-16		

Card Guaranteeing Wage Base Handed to Workman

ceeding operations depend upon the accuracy of vital or holding points. Full or 100 per cent gaging is always done on these holding points but not all gaging points are given 100 per cent inspection. On some parts, such as gun parts which are to be assembled in the factory, the gaging is sometimes as low as 5 per cent, but on those parts which are to be used for field or base repairs the inspection is always 100 per cent. Where there is any probability of faulty parts causing loss of time in assembling, it has been determined that it is cheaper to gage 100 per cent than to spend the time adjusting these faulty parts in the assembling shop. All the gaging is not left to the inspectors, for the operators are also paid to do periodic gaging, this being a part of the rate of pay as determined by time study.

Inspectors Placed Under Foremen

The inspectors are directly in charge of the foremen in accordance with the policy of holding the foremen responsible for quality. The supervisor of inspection acts in an advisory capacity and the inspection overseers are also to a large extent operating likewise in an advisory capacity. There is rarely any friction between the inspection men and the foremen, but if differences arise the inspection supervisor is called in. Of course, part of the success of the plan of holding the foremen responsible for inspection work lies in the careful selection of foremen. The foremen and the preparation overseers are held responsible for the condition of the gages. The preparation section makes periodic inspection of the gages, checking them against master gages.

At final inspection stations an instruction card is located in front of each inspector, thus removing any uncertainty as to the work to be done on any particular piece. A complete file is kept of inspection records, and foremen when starting on a new or an old job are warned of previous troubles that have arisen in the course of the work. Every piece of steel carries an identification mark and if it is necessary to remove these marks in any part of the machining they are immediately replaced.

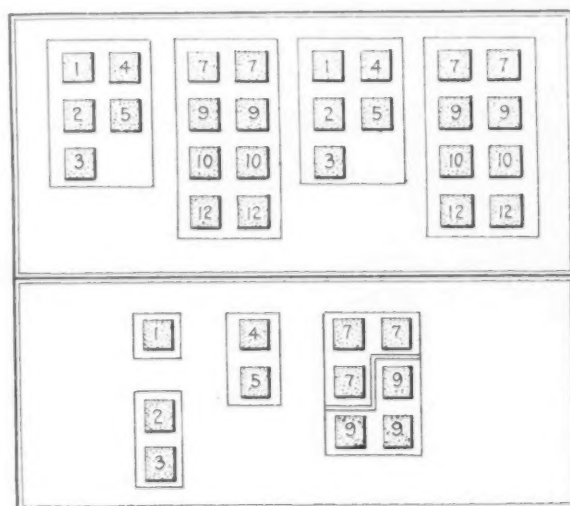
Time Study in Winchester Plant

In the beginning of its business the Winchester company decided to have its goods made by contract. The company furnished everything but labor which was hired by the contractor, who, in most cases, was a fairly good mechanic but had absolutely no conception of system of any kind and was more or less of a driver, usually more. Some of the evils of the old contract system existed until the great growth of the company took place in 1915. One of the first tasks that confronted the new management was to set new and more equitable rates

than then prevailed. The great demand for men in munitions work and the rapidly advancing scale of wages made it imperative that wages in the Winchester plant should be advanced, so the management turned to time study experts for aid. In the very beginning, Mr. Otterson, then general superintendent, talked to the men explaining the object of time study and making clear the gain that was to be expected. In this task the superintendent of the gun department ably assisted and the men were prevailed upon to give the new method of rate setting a fair test.

The Winchester management issued a card guaranteeing the rates that were set so long as no change was made in the method of operation on the work. This special guarantee card has been found to have a strong appeal to the men and has been a factor in enabling the company to continue its time studies and the study of rates scientifically without a protest from the men, in fact with hearty co-operation as they grew to understand the benefits that came to them because of this time study work. Only on one occasion has there been any trouble over rate setting and that was in one shop where the men threatened to go on a strike if the company did not immediately time study their jobs. This difficulty was easily smoothed over until the time came when the time study group could get busy on the operations involved.

Time study work in the gun department was started in October, 1915, with two men, the object being to train these men to work up studies and, as they became proficient, to take on other men and in this way to build up an organization. It soon developed that it was a difficult matter to obtain satisfactory men and it became apparent that it would be necessary to train men outside of the organization in the methods of manufacturing in the gun department. Accordingly a plan of study was laid out and the men with technical training were engaged and given a course of training on the different types of machines. In this way a number of good men were finally developed. As the work went along the results obtained by time study were so encouraging that it was deemed advisable to increase the force in order to carry on the work more extensively. This was done as rapidly as possible but at no time were more than fifteen men engaged in this work. One reason for this was that the time study division proved to be a training school for men to fill executive positions about the plant and the gun department division was also a



The Upper Grouping of 26 Machines Was Replaced by the Lower Grouping of 11 Machines

training school for men selected to do time study in other departments.

In the work of setting rates, a time study man and an expert machinist, usually a process engineer, collaborated on each job, the expert machinist being particularly helpful in detecting the spirit of the operator. In no case were the best men taken for tests, the effort being to find an average man. By this process, after the first few rates were made, the men took to the scheme and its success was assured. Naturally the first work was on the military models but it has now been extended to virtually all the important jobs in the various shops.

Time Study Cut Equipment Costs

The first time studies were taken in a shop engaged in the manufacture of one of the most important components of a military rifle. At the end of about five months enough time study had been taken and worked up to show that the required production could be obtained from the existing equipment by the correct manipulation of the feeds and speeds and by proper rearrangement of machines. A further gain was made by not allowing one man to operate more machines than he could

RECORD OF TIME WORKED AND EARNINGS CREDITED TO EMPLOYEE NAME AND NUMBER NUMBER AND NAME OF OPERATION				UNIT <i>Per Piece</i> TIME WORK SHOULD TAKE PER UNIT <i>A3 Mins.</i>			
CHARGE EXCESS EARNINGS ONLY TO STATE OF THE RESPONSIBILITY AND COMPLETION OF OPERATION				PREL. WORK BONUS PER UNIT TO BARE BASIS			
MONTH	DAY	HOURS	NUMBER OF UNITS FINISHED	ACTUAL PRODUCTION PER HOUR	THE BASIC PREMIUM A - 1 - B 2 NO. OF UNITS - 7 PREPARATION TIME, BASIS TOTAL TIME BASIS SLAYED TIME T - 1 PREMIUM TIME T - P		
<i>2</i>	<i>17</i>	<i>10</i>			<i>20.00</i> <i>200.00</i> <i>20.00</i> <i>180.00</i> <i>160.00</i> <i>10.00</i> <i>170.00</i>		
<i>2</i>	<i>18</i>	<i>10</i>			<i>20.00</i> <i>200.00</i> <i>20.00</i> <i>180.00</i> <i>160.00</i> <i>10.00</i> <i>170.00</i>		
<i>19</i>	<i>10</i>				<i>20.00</i> <i>200.00</i> <i>20.00</i> <i>180.00</i> <i>160.00</i> <i>10.00</i> <i>170.00</i>		
TOTALS			<i>30</i>	<i>600</i>	TOTAL DATE PROD. PER UNIT 1 UNIT		
EARNINGS ENTERED ON PAY SHEET COST SHEET				CARRY OVER CARD FOR PIECE-WORK BONUS OR PREMIUM EARNINGS COPY 2 TO OPERATOR COPY 2 TO FILE			
21524 SM 10-17				OPERATOR'S NAME PREMIUM PERCENT			

Calculation of Premium Earnings

ated by one man. After the time study was made it was decided that two operations were unnecessary and they were therefore canceled. By changing the feeds and speeds of all machines it was seen that a greater production could be obtained and it was obvious that in order to obtain this increased production it would be necessary to reduce the number of machines assigned to each operator. The

PIECE WORK INSTRUCTION CARD		PREMIUM INSTRUCTION CARD	
DETAIL INSTRUCTIONS		DETAIL INSTRUCTIONS	
NO.	DESCRIPTION	FEED INCHES PER MIN.	SPEED R.P.M.
1	Pick up work box and place on bench .10x1/250		.001
2	Pick up handful of pieces .06 x 1/20		.002
3	Place piece under reamer, REAM, remove 165%		.004
4	Remove handful of pieces from table .04x1/20		.002
5	Get down finished work pall .10x1/250		.001
6	Get down finished work pall .10x1/250		.040
.040 Min. (Handling Time) at 59.5%			.024
Allowance for washing up and oiling machine 2.5%			.064
			.002
			.066
OPERATOR: _____		MACHINE NO: _____	
DATE: 4/27/16		TIME: 10:10	
SIGNATURE: _____		SIGNATURE: _____	
UNIT: 3081		UNIT: 3081	
REWORK: 910		REWORK: 910	
TIME: 1.24		TIME: 1.24	
COST: \$.038		COST: \$.038	
MATERIAL: 1.00		MATERIAL: 1.00	
TOTAL: 1.00		TOTAL: 1.00	
REMARKS: _____		REMARKS: _____	
DRAWING: _____		DRAWING: _____	
SPECIFICATION: _____		SPECIFICATION: _____	
QUANTITY: _____		QUANTITY: _____	
DATE: _____		DATE: _____	
TIME: _____		TIME: _____	
COST: _____		COST: _____	
MATERIAL: _____		MATERIAL: _____	
TOTAL: _____		TOTAL: _____	
REMARKS: _____		REMARKS: _____	
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TOTAL: _____		TOTAL: _____	
REMARKS: _____		REMARKS: _____	
DRAWING: _____		DRAWING: _____	
SPECIFICATION: _____		SPECIFICATION: _____	
QUANTITY: _____		QUANTITY: _____	
DATE: _____		DATE: _____	
TIME: _____		TIME: _____	
COST: _____		COST	

Instruction Cards for Piece and for Premium Work

consistently keep running. At that time a large number of machines were on order but, owing to market conditions, deliveries were delayed. This enabled the time study division to show the importance and profit of its work because, as a direct result of its report, orders for 177 machines and 219 fixtures were canceled, involving a total valuation of approximately \$190,000. This particular case is a good example of the work of the time study division and of its achievements in various parts of the plant.

Milling machine operators on this work were running anywhere from four to eight machines and earning an average of 25 to 27 cents an hour. The machines were then grouped as shown in one of the illustrations. Each of these groups was oper-

machines were then regrouped as shown. One machine on operation No. 1 was operated individually, producing 66.5 pieces per hour. One machine on operation No. 2 and one on No. 3 were grouped and run together, producing 65 pieces per hour. It was necessary to add one more machine to operation No. 7 and one more machine to operation No. 9 in order to turn out the required production. Accordingly on these operations one operator runs three machines, each group producing 15 pieces per hour per machine. By thus regrouping the machines and reducing the number of machines run by a single operator, the production was materially increased and the earnings of the operator increased from 25 to 27 cents an hour to 40 to 46 cents an hour. This particular example reflects the spirit

of the new organization and the result of engineering efforts, properly applied.

In the manufacturing departments, that is, the gun and cartridge shops, the straight piece work plan is in operation. In figuring piece work rates, base rates have to be established for different classes of work, corresponding to the day rates for each particular class. As ordinarily the time to do work determined by time study is based upon a much higher rate of speed than if done on day work, an inducement must necessarily be offered. This inducement varies from 33 1/3 per cent to 66 2/3 per cent, according to the nature of the work. This percentage is added to the base rate per machine hour and this sum divided by the number of pieces per hour at full production, as determined by time study, in order to obtain the piece rate per piece or per unit number of pieces.

In the tool department the Towne-Halsey premium plan of wage payment, based upon time study, is in operation. In the Towne-Halsey plan the operative receives as a premium one-half of the time saved. The time from which the premium is computed is called the time basis and is two-thirds greater than the task time, or time it should take to do the work, which has been determined by study. From the operation or job card the elapsed time to perform a given operation is obtained and the premium earnings derived therefrom are figured on a slip which is here shown. The day work earnings are figured on the job cards. Each job or operation card, before the operative gets it, has been marked "premium," and on the back is put the task time per piece and the time basis. This is called rating the cards.

How Rates Are Set

In each shop there are one or more rate setters who come under direction of the planning overseer, but work in conjunction with the time study division. The information for setting rates is supplied by the time study division. Its duty is to take time studies, write up instruction cards, compile tables

for standard operations, and supply standard time elements and standard feed and speed tables to enable the rate setters to write instruction cards for the infrequent occurring jobs and to set the rates for the operatives.

Besides the rate setters, each shop has one or more men who go among the operatives and assist them in carrying out the directions given on the instruction card and report where the instruction cards seem in error and to need correction. They also set the speeds and feeds for the day work operatives. These men are called assistant overseers of production and are under the overseer of production, but work in conjunction with the rate setters. This same routine of rating job cards is carried out in the maintenance department. In that department on manufacturing jobs the piece work plan is used, and it is only on straight jobbing work that the premium plan is in operation.

In the gun and cartridge departments, owing to the fact that the work is repetitive, and that comparatively few different parts are being made and that a rate once set stands for all time or until a new method is devised, the work of rate setting is greatly simplified. One rate setter or rate clerk, as he is usually called, can look after and put into operation a great many rates and have time to attend to other matters. In consequence it is not necessary to have a rate clerk in each of the shops, and one rate clerk, with assistants, located in the central office of the department, takes care of all the rates of the department. This clerk is an assistant to the planning supervisor, but works in conjunction with the time study division, notifying the time study head when a rate is required, and obtaining from the time study division the new rate with the instruction card and the guarantee of rate card. The rates are not shown on the back of the operation or job cards, but the operatives are notified by their production overseers, who give them the rate and the hourly production the rate is based on. They are also given the instruction card and the guarantee of rate card.

Need of Mechanical Laboratory Assistants

B. B. Fogler, mechanical engineer in charge of the Mechanical Research and Development Division, Army Defense Problems, American University, Washington, D. C., states that the Government is in need of a number of mechanical laboratory assistants and draftsmen for important war work in the development of parts from sheet metal, fabric and rubber. Graduates from manual training schools with one or two years' shop experience or men with one or two years in an engineering school are desirable, and the pay is dependent upon ability and experience. Applicants are asked to send a small photograph and state their age, references, positions in the draft and willingness to enlist or be inducted in the army for work of this nature, if requested to do so.

In spite of the labor shortage conditions, the Nova Scotia Steel & Coal Co.'s plant, New Glasgow, N. S., in the month of May, broke all previous records for the production of steel and iron. The open-hearth plant produced 14,558 tons of steel ingots, and the blast furnaces 8835 tons of pig iron, as compared with 14,243 tons of steel and 8016 tons of iron in March, 1917, when the best previous record was made. The net gain is 316 tons of steel and 818 tons of iron.

The National Association of Purchasing Agents has addressed both houses of Congress, endorsing the action of the Federal Trade Commission in seeking anti-commercial bribery legislation. L. F. Boffey is secretary of the association at 25 Beaver Street, New York.

Pennsylvania Railroad Hiring Many Women

To gain some idea of the rate of the present labor turnover on the Pennsylvania Railroad, and particularly the extent to which men are being replaced by women, a special record was kept for the 10-day period from May 27 to June 5 inclusive on all divisions of the Lines East. In the period named 4477 employees left the service and 5122 new ones were hired. The net gain of 645 occurred entirely in the last two days of the period and was apparently sporadic. The figures relate to divisional forces only, and exclude the forces in the general offices. The most interesting feature was the rapid increase in the number of women employees on the payroll, accompanied by a decrease in the number of men. On May 27 there were 5682 women employees and on June 5, in a period of only 10 days, this had increased to 7227. Thus, in the period under question, 1545 more women were hired than meanwhile had left the service. The figures would indicate that during the 10 days in question there had been a loss of exactly 900 male employees as against a gain of 1545 female workers. With divisional forces of 148,000 to 150,000 the above record points to a 100 per cent labor turnover in a year.

Illustrating the rush now on at aeroplane factories, the C. L. Morris Co., Plymouth, Ind., sends white ash and white oak pieces 8 ft. x 4 1/2 in. x 1/2 in. to aeroplane factories by express as it manufactures them. From other factories in the State, it is said, small parts for aeroplanes are being sent by messengers in order to make better time than by freight or express.

HEARINGS ON TUNGSTEN

Extensive Tariff Commission Inquiry on Domestic Minerals

WASHINGTON, June 11.—An exhaustive investigation of the production, importation and consumption of numerous mineral products, including the principal steel hardening metals, antimony, quicksilver, etc., has been undertaken by the United States Tariff Commission. The first hearing will relate to tungsten and will be held in Denver, Colo., on Monday, June 17. On Monday, June 24, a hearing on antimony will be held at San Francisco at the Chamber of Commerce, which will be followed by hearings on quicksilver on Wednesday, June 26, and on tungsten on Friday, June 28. Invitations have been sent out to producers, importers, manufacturers, consumers and representatives of labor organizations interested in these industries, 500 persons having been asked to attend the tungsten hearing, 150 to be present at the conference on quicksilver, and 60 at the hearing on antimony. Upon the conclusion of these hearings the commission will announce further features of its program, which it is understood will include other hearings on manganese, chromium, and molybdenum.

Data for Conservation and Tariff Purposes

These hearings or conferences are being held pursuant to a project now being worked out by the commission for the systematic assembling of information on the leading industries of the country, especially those of importance in the conduct of the war, with a view to presenting the facts in well digested form for the guidance of Congress in connection with both conservation and tariff legislation. The commission, in its preliminary work, is receiving valuable assistance from manufacturers, dealers and consumers and this co-operation is being rapidly extended and strengthened. Engineering societies and Government bureaus are assisting in the work and the principal labor organizations have been asked to supply data concerning all labor phases of these important problems. The conferences at Denver and San Francisco are specially designed for the purpose of securing information in regard to recent disturbances and changes in the tungsten, quicksilver and antimony industries. The topics to be discussed will fall under three heads: (1) the condition of the American industry before the war, in relation to foreign competition; (2) the effect of the war on the industry; (3) competition with foreign producers after the war.

The Tungsten Inquiry

The commission announces that the conference with respect to tungsten "will take the form of an inquiry into the effect of the war upon production, markets, plant expansion, increase in cost of materials and wages since 1914, and post-war competition—all of which will be considered in their bearing upon the tariff. Imports and exports, relative foreign and domestic costs of production of metals and products, and the adequacy of American ore deposits for domestic needs will be among the subjects discussed."

In beginning its investigation of the tungsten industry in Colorado and California the commission hopes to secure information at the very sources of supply. The principal deposits of tungsten ore of commercial value, which are actively exploited, are located in the Mojave Desert and at Bishop, California. The Atolia district in the Mojave Desert is the world's largest producer of scheelite, the white calcium tungstate. Other important tungsten districts are Boulder County and Silverton, Colorado; Dagoon, Yucca, Tiptop, Huachuca Mountains, and other points in Arizona; and the Black Hills of South Dakota. There are smaller deposits in Colorado, Arizona and South Dakota and in Idaho, Washington, Oregon, New Mexico and Utah.

In 1916, the latest year for which world's production figures are available, about 65 per cent of the world's supply was produced by four countries, the United States furnishing 21.7 per cent, Burma and the Shan

States 19.4 per cent, Bolivia 51.1 per cent, and Portugal 8.4 per cent. The total world's production in 1916 closely approximated 24,000 net tons of concentrates containing 60 per cent of tungsten trioxide.

Most of the tungsten deposits are located in States in and west of the Rocky Mountains, while the users of ferrotungsten and tungsten powder are located in the Eastern States. Some ferrotungsten and tungsten powder is manufactured in the Western States and transported to the Eastern States in that form, but as most of this alloy is made in the Eastern States the bulk of the ore is transported across the continent.

It is possible that with continued heavy demands upon the tungsten resources of this country the larger mines may give out, and the easily mined ores of the countries from which we import may also give out as they have in Australia. It may then be imperatively necessary to develop some of the smaller deposits not now workable at a profit.

Bearing on the Foster Bill

It will be noted that the information to be gathered by the Tariff Commission will bear quite as directly upon the problems underlying the Foster mineral control bill as upon the question as to whether tariff protection is necessary to establish permanently this industry and others like it in this country. On the basis of the data now available Congress has reached the conclusion that it is impracticable to cut off foreign sources of supply of these metals even for the important purpose of conserving shipping for the transatlantic movement of troops and supplies without stimulating domestic production in some more or less artificial manner.

It is probable that arrangements will be made whereby reports of the hearings will be available to the House and Senate Committees on Mines and Mining in order that they may be considered in the framing of the final draft of the Foster bill, which, from present indications, will be completed by a conference committee appointed to harmonize the diverse provisions of the House and Senate measures.

W. L. C.

New Members of the Philadelphia Foundrymen's Association

The following are newly elected members of the Philadelphia Foundrymen's Association:

Lobdell Car Wheel Co., Paul S. Reeves & Son, McHatton Foundry Co., Huxley Bronze Casting Co., Southwark Bronze Co., Girard Smelting & Refining Co., Bureau Brothers, Haines Jones & Cadbury Co., McCambridge & Co., J. E. Lonergan Co., Philadelphia Sash Weight Works, Driscoll-Reese Steel Co., Morton Steel Casting Co., George Oldham & Son Co., David Lupton Sons Co., Ross Tacony Crucible Co., Robert J. Taylor, Inc., Harbison-Walker Refractories Co., Philadelphia Fire Brick Works, Hyzer & Lewellen, Richard C. Remmey Son Co., George F. Pettinos, Charles E. Pettinos, Quigley Furnace Specialties Co.

The Austin Co., Cleveland, has recently taken the following new contracts for factory buildings: A one-story building 60 x 140 ft. and a two-story building 35 x 45 ft. for the International Money Machine Co., Reading, Pa.; building 60 x 243 ft. for the General Electric Co., Schenectady, N. Y.; a foundry extension 90 x 100 ft. for the Monarch Tractor Co., Watertown, Wis.; an additional story 30 x 160 ft. to the foundry building for the General Aluminum & Brass Co., Detroit; a building 100 x 120 ft. for the Dow Chemical Co., Midland, Mich.

Rapid progress is being made by the Great Lakes Dredging Co. on the docks at Ojibway, Ont., for the Canadian Steel Corporation. The contract for docks and dredging alone involves an expenditure of approximately \$2,000,000. It is expected that this undertaking will be completed before winter sets in. To date no work has yet been started on the steel plant proper, although plans have been prepared and work on the foundations will be started this summer.

J. L. Replogle Takes Over Steel Distribution

After Priority Certificate Material, Orders May Be Filled in Preferred List—Weekly Reports of All Pig Iron and Steel Shipments

WASHINGTON, June 11.—The War Industries Board, as the result of a careful survey of the findings of the joint committee of the board and of the American Iron and Steel Institute, recently appointed to investigate the requirements of the Government and the essential industries of the country as compared with the prospective production of iron and steel, has formulated a plan under which the Director of Steel Supply will practically take over the distribution of the iron and steel output and allocate it, first, to plants, Governmental and private, making war material; second, to manufacturers of so-called "essential" products included in the current preference list of the priorities committee, and, third—assuming a surplus for this purpose—to other officially approved consumers.

At Least 85 Per Cent for War

In view of the estimate that the Government will need at least 85 per cent of the total output of the industry for strictly war purposes, it is a question as to whether there will be a surplus after all allocations have been made to plants included in the preference list; but the officials of the board are inclined to the opinion that while there may not always be a margin there will be from time to time considerable quantities of iron and steel for general consumption and the board pledges itself to adopt every possible device in connection with the steel distribution to reduce to a minimum the hardship suffered by the non-essential industries. Steps will be taken immediately to increase the output of the iron and steel industry in the most practicable manner, although, for the present at least, this feature of the program will not involve any considerable amount of new construction, as blast furnace capacity is not yet being utilized to the maximum on account of the current coke and labor shortage.

Text of the Resolutions

The War Industries Board on June 6 adopted the following resolutions:

"Resolved by the War Industries Board that the following agreement, reached as a result of several conferences between a committee of this board and the American Iron and Steel Institute, be and the same is hereby ratified, confirmed and approved, to become effective at once:

"Whereas, a careful study of the sources of supply in connection with the present and rapidly increasing direct and indirect war requirements for iron and steel products has convinced the War Industries Board of the necessity for (1) a strict conservation of the available supply of iron and steel products, on the one hand, and (2) the expansion of existing sources and development of new sources of supply of iron and steel products, on the other hand; and

"Whereas, the producers of iron and steel products in the main concur in this conclusion reached by the said board and have expressed their willingness to wholeheartedly co-operate with the said board in its efforts to provide for promptly meeting the direct and indirect war requirements of the United States and its Allies for iron and steel products;

"Now, Therefore, it is understood and agreed by the Committee on Steel and Steel Products of the American Iron and Steel Institute and the War Industries Board that no pig iron or steel manufactured products shall be shipped or delivered, except as follows:

- (1) By priority certificates issued by the Priorities Division of the War Industries Board; or
- (2) After priority certificates shall have been issued for or filled, then producers of pig iron and of steel manufactured products may utilize such raw materials and manufacturing capacity, if any, as they may have available, to fill orders of their customers not covered by priority certificates, provided such orders are embraced within the schedule of purposes entitled to preference treatment as determined by the Priorities Board as follows:

Ships. Including destroyers and submarine chasers.
Aircraft.

Munitions, Military and Naval Supplies and Operations. Building construction for Government needs. Equipment for same.

Fuel. Domestic consumption. Manufacturing necessities named herein.

Food and Collateral Industries. Foodstuffs for human consumption and plants handling same. Feeding stuffs for domestic fowls and animals, and plants handling same. All tools, utensils, implements, machinery, and equipment required for production, harvesting and distribution, milling, preparing, canning and refining foods and feeds such as seeds for foods and feeds, binder twine, etc. Products of collateral industries, such as fertilizer, fertilizer ingredients, insecticides and fungicides. Containers for foods and feeds, collateral products. Materials and equipment for preservation of foods and feeds, such as ammonia and other refrigeration supplies, including ice. Including all necessary raw materials, partially manufactured parts and supplies for completion of products.

Clothing. For civilian population.

Railroad. Or other necessary transportation equipment, including water transportation.

Public Utilities. Serving war industries, Army, Navy, and civilian population.

"Provided, however, whenever the Priorities Board shall have promulgated and certified for observance to the producers of pig iron and steel manufactured products, a revised preference list, no surplus material or capacity after filling or providing for all orders covered by priority certificates shall be used to fill non-priority orders save such as are placed by industries or plants embraced within such preference list; and

"Provided further that each producer of pig iron and of steel manufactured products shall at the end of each week, ending with midnight Saturday thereof, prepare and forward to the Director of Steel Supply of the War Industries Board a detailed statement of all shipments made during such week not covered by priority certificates. Be it further

"Resolved that should any producer of pig iron or of steel manufactured products have any surplus war material or manufacturing capacity after filling (a) all orders covered by priority certificates and (b) all orders embraced within the schedule of purposes entitled to preference treatment or placed by industries or plants embraced within the revised preference list, after it shall have been promulgated and certified by the Priorities Board, then in such event such surplus materials or capacity may be disposed of by such producer or manufacturer to other customers subject to the approval in writing of the Director of Steel Supply first had and obtained. Be it further

"Resolved that the Director of Steel Supply and a committee appointed by the American Iron and Steel Institute shall jointly make a careful study of the present and prospective iron and steel requirements of each and every department and agency of the Government of the United States and of its Allies, and the

capacity of the iron producing and steel manufacturing plants of the United States to meet such requirements and present to this board as early as practicable (1) a report of their findings together with (2) recommendations of measures if any which should be taken to stimulate and increase the production of iron and of iron and steel products in order to meet the direct and indirect war requirements and the demands of industries of exceptional or national importance."

Present Priority Practice

In authorizing the publication of these resolutions Chairman Baruch, of the War Industries Board, stated that "the purpose of the board in taking this action is to insure the direct and indirect war requirements of the United States and its Allies being fully met, after which whatever surplus production there may be shall be equitably distributed among the industries not engaged in war work."

Some explanation of these resolutions is necessary to render them comprehensible to those who are not familiar with the technical details of the priority methods now pursued by the War Industries Board. It will be observed that in the distribution of all pig iron and manufactured steel products, material covered by priority certificates is given precedence. At the present time this classification covers practically every form of war material including warships, merchant vessels, ordnance of all kinds, general supplies for the Army and Navy, material for railroad construction and equipment, etc., etc.

Material Over and Above Priority

After the demands of priority certificates have been met deliveries may be made to plants included in the current preference list of the War Industries Board. This list, as set forth above, has been compiled at joint conferences of representatives of the Food and Fuel administrations, the Railroad Administration, and the priorities committee of the War Industries Board. It should be explained that it was not framed with special reference to its use in connection with the distribution of iron and steel and therefore its application to the problem now in hand is not so definite as it would have been had it been framed with direct reference thereto. It is obvious that many plants included in the preference list are now being regularly supplied with materials under priority certificates, notably in the case of naval and merchant ships, aircraft, munitions, military and naval supplies, railroad equipment, etc. Such plants are doubly safeguarded by priority certificates and by inclusion in the preference list. In this list, however, are many manufacturers who are not using priority certificates and it should be understood that the entire category of preferred plants is under close daily scrutiny and subject to constant revision, a statement that will explain the reference to a "revised preference list" embraced in the first proviso to the board's resolutions.

The preference granted to fuel in the above list is intended to cover all iron and steel required by the coal mines, oil wells and refineries and in connection with the consumption of fuel for domestic purposes and for the manufacture of the commodities embraced in the entire preference list. Similarly the preference for clothing is designed to cover all steel used in the manufacture of machinery employed by the clothing industry.

Steel Committee Will Continue to Act

The closing paragraph of the board's resolutions foreshadows the continuance of the joint committee of the board and the American Iron and Steel Institute for an indefinite length of time for the purpose of studying the present and prospective requirements of the Government and its Allies and the capacity of the iron and steel manufacturing plants of the country. It has been

found impossible to obtain an accurate estimate of the requirements of the Government and it is this fact that renders it so difficult for the authorities to determine what surplus, if any, will be available for the use of the general consumers after plants covered by priority certificates and the preference list have been provided for. Within the past week the Director of Steel Supply has been advised by the various departments of the Government of new requirements, not included in any previous estimate, aggregating more than 3,000,000 tons of finished steel. The programs of the Shipping Board and the Ordnance Bureau and the demands of the Allies are still rapidly expanding and the end is not yet in sight.

May Fall Short on Preference List

It is altogether probable, in the opinion of the Director of Steel Supply and other members of the board, that occasions will arise when it will be impossible to supply even the plants included in the preference list with 100 per cent of their needs, but in seeking to do so pig iron and all forms of semi-finished steel will be transferred from the plant of one consumer to that of another wherever necessary, due regard being given to the avoidance of hardship. While the officials are not seeking publicity for such transfers, it is a significant fact of which no concealment is made that they are becoming more and more frequent and that in the aggregate very large amounts of material are thus being moved from plants which do not vitally need them to others where the necessity is greater. In nearly all these cases the owners of the material are freely relinquishing it and no instances have come to light where any form of duress has been employed.

The Automobile Industry

In view of the necessity for curtailing the consumption of steel by non-essential industries many inquiries have been received here respecting the program to be enforced with reference to the building of pleasure cars by the automobile manufacturers. Several conferences with these producers have been held here but, pending the survey by the joint steel committee, it was not practicable to reach any definite conclusions. The policy finally adopted by the War Industries Board leaves the position of the automobile manufacturers shrouded in still greater uncertainty for the reason that it is impossible for the Director of Steel Supply to estimate the amount of steel that will be available for pleasure cars or for any other non-essential purpose. That there will be some steel for this purpose, Mr. Replogle believes, but that it will be a fluctuating quantity which cannot be reduced to a fixed percentage of any previous year's output now seems certain.

Special Efforts to Keep Consumers Going

As an indication of the general policy to be followed with respect to this and other industries, the case may be cited of an automobile manufacturer who recently came to Washington to secure a very small quantity of steel for axles with which to complete a lot of pleasure cars the aggregate value of which ran into several million dollars. The producer had obtained all the other materials required and lacked only 6 per cent of the tonnage of steel necessary to complete his orders and turn the cars into cash. Mr. Replogle was able almost immediately to locate a quantity of rejected projectile steel which, although differing slightly in carbon content from the automobile manufacturer's specifications, was available for the manufacture of the desired axles and thus a very perplexing problem was solved and a heavy financial loss averted.

In another similar case the State of New York required a certain amount of sheet steel for automobile license tags and applied to the Director of Steel Supply after several ineffectual attempts to obtain the material

through the usual channels. Mr. Replogle was able to locate a sufficient quantity of waste sheets which were entirely satisfactory for the purpose as high-grade material was not essential.

In dealing with all the industries of the country, including the automobile manufacturers, the Government will constantly keep in mind the competitive situation both at present and as it may exist at the end of the war. Allocations of material for non-essential purposes will be made with the principle of equity constantly in view and no single manufacturer in any trade will be allowed advantages which his competitors do not enjoy. Cases have recently been brought to the board's attention which call for discrimination along this line and which have been handled with absolute impartiality. A certain small manufacturer complained to the board that a large competitor was enabled to obtain an unlimited supply of steel because of his relations with certain steel mills and presumably because his requirements were so large that the steel makers regarded him as a preferred customer. All such advantages will be leveled down wherever possible and undue preference prevented.

No New Capacity Contemplated

The conclusions of the War Industries Board with respect to the practicability of securing a substantial expansion of the productive capacity of the iron and steel industry are significant. In some quarters it has been surmised that the board would recommend a large amount of new construction, some of which might even be wholly financed by the Government. Nothing of the kind is now contemplated and the program to be pursued hereafter will be worked out carefully in accordance with industrial developments. Some increase in plate mills may be sought in view of the expansion of the shipbuilding program, both naval and merchant, and to provide for the rolling stock needed by the Railroad Administration. In the opinion of the Director of Steel Supply, however, it is not necessary to consider further construction of steel mills or blast furnaces at this time or until the coke supply has increased to a point to permit the operation at maximum capacity of all existing furnaces. Today the coke situation is the "neck of the bottle" and the officials do not believe that it would be advisable to utilize any of the much needed current output of steel in the construction of new works until the supply of pig iron reaches a point that will test the capacity of existing plants.

Reports received by the War Industries Board indicate that the general transportation situation, so far as it affects the movement of iron and steel, is in a fairly satisfactory condition and that it will steadily improve during the remainder of the summer. The new "even car supply" system, inaugurated by the Fuel and Railroad administrations for the benefit of the coal operators, promises to be very helpful in solving the coal and coke problem and the extension of the principle to plate mills and fabricating shops will undoubtedly afford substantial assistance to the shipyards.

Labor Supply a Matter of Concern

The labor situation is unquestionably giving the War Industries Board much concern. Chairman Baruch has given special attention to this matter and has followed with interest the development of the war organization of the Department of Labor with special reference to the labor supply of the essential industries. The officials are unwilling to discuss the details of their plans but it is known that the employment service of the Department of Labor is making every possible effort to provide workers for all branches of the iron and steel industry. There is some talk of providing a special exemption from military service for skilled workers in the steel mills but there is no indication as to how

this plan will be carried out. The Provost Marshal General feels that the War Department, in establishing several deferred classes based on essential character of employment as well as upon dependents, has gone as far in this direction as circumstances warrant and it is a question whether it will be found practicable to provide a special exemption.

Mr. Replogle's Larger Activities

The immediate expansion of the bureau over which the Director of Steel Supply presides is made necessary by the routine prescribed in the resolutions of the War Industries Board. Provision must be made for the reception and collation of weekly reports of all deliveries to plants included in the preference list of the priorities committee and a corps of experts must be provided to take care of the numerous applications which it is anticipated will be made for permission to deliver surplus iron and steel material to general consumers not covered by either priority certificates or the preference list. Mr. Replogle states that he will need at least 100 competent assistants and that they will be employed as rapidly as their services can be secured.

W. L. C.

Fullest Use of New York State Barge Canal Urged

G. A. Tomlinson, in a recent letter to the Chamber of Commerce of the State of New York, urged that the fullest possible use be made of the New York State barge canal which is now completed and ready for operation as soon as necessary barges are provided. He states that unless merchants and manufacturers begin promptly to utilize this waterway, which is the largest and most important transportation canal in the country, to the utmost practicable extent, the railroad administration inland commission will be unprepared to relieve the impending congestion incident to moving the grain crop and food products to the seaboard in the fall months. He especially emphasized the importance of manufacturing interests furnishing the movement of freight which shall justify the large capital expenditures already incurred by the State and Federal Government, and relieve the railroads of a corresponding traffic burden.

Mr. Tomlinson announced in the letter that contracts had been let for a large fleet of steel and concrete boats, and that terminals are ready for use at New York, Buffalo and other cities along the route of the canal, and also called attention to the Government's action in establishing favorable rates for canal and rail service.

A resolution was adopted by the chamber at its session authorizing a committee to undertake to effect increased use of the canal by New England and New York manufacturers.

Enjoining Strikers

The right of the Federal Court to enjoin strikers from interfering with the manufacture of war munitions for the Government was upheld in a decision filed at St. Louis June 7 by United States District Judge Pollock. The decision was in a case brought by the Wagner Electric Co., St. Louis, to restrain strikers from interfering with its operations and a temporary injunction was granted by United States Judge Dyer, whose action was made permanent by Judge Pollock. The point that both parties were under the jurisdiction of a single state was overruled.

The Whitman Agricultural Co., St. Louis, which has been manufacturing agricultural machinery for 46 years, has decided to cease operations and has offered its plant for sale with a river-front site, railroad switch connections, etc., embracing 11 acres and 10 buildings.

A Three-Operation Mmunition Machine

To enable three operations in the manufacture of munitions to be performed at one setting, the Buffalo-Pitts Co., Fourth and Carolina streets, Buffalo, has developed a special machine. Its functions are to cut off the open end of the shell forging to a predetermined length from the inside of the base, to drill a centering socket in the outer surface of the base and to face off the outer surface, thus giving a predetermined thickness of base. The first and third operations are performed simultaneously, thus materially reducing the length of time required, as well as eliminating the two additional machines and the handling required to place the work in them and remove it.

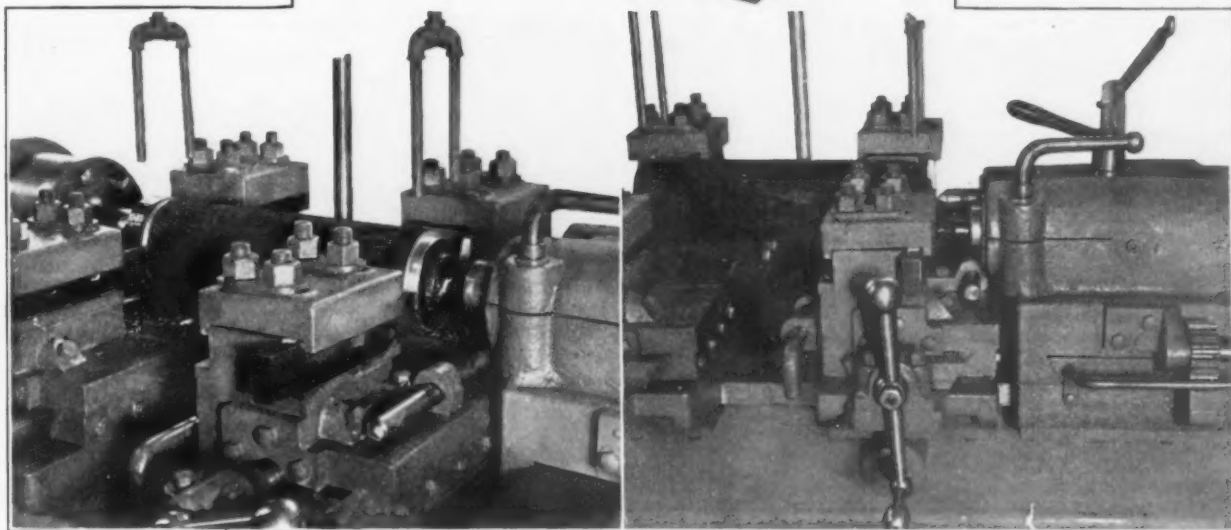
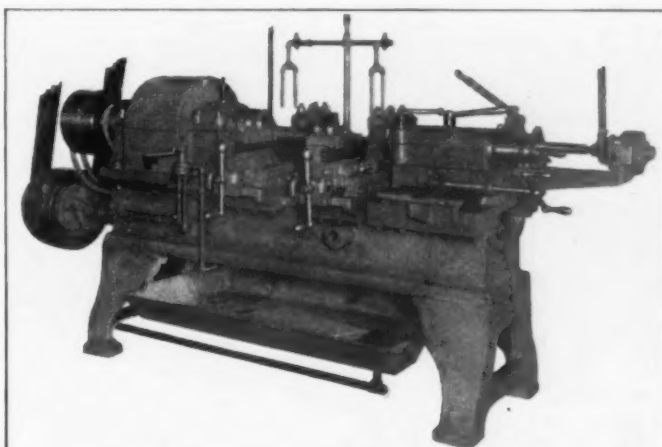
In general appearance the new machine resembles an ordinary lathe, in that it has a conventional type of bed and a headstock containing a spindle in which is attached an internal expanding mandrel operated by air or other means. The differentiating features are the use of two carriages each supporting a front and a rear cross slide and a tailstock, which in addition to traveling along the bed in the customary manner can be moved backward and forward across the ways. The tailstock also has a dead center of the conventional type, as well as a live spindle.

Each pair of cross slides is operated by a feed screw having both right- and left-hand threads, this arrangement causing the cross slides to approach or recede from the work according to the direc-

tion in which the screw is rotated. When the slides are being fed toward the work, the feed screws are rotated by wormwheels driven by worms carried on a feed shaft. Clutches which may be opened automatically to stop the movement of the cutter at any predetermined point serve to lock the wormwheel to the feed screws. For backing the cutters away from the work the screws are rotated in the opposite direction by handles. The clutches which lock the wormwheel to the feed screws are of the ordinary type and are operated by a sliding rod to which an adjustable collar is secured that can be set at any position to disengage the clutch when the cross slides have reached the predetermined position.

The tailstock is mounted upon a slide and is operated by a rack and pinion, the latter being rotated by a handle or wheel attached to its shaft. The tailstock has three steps or positions for longitudinal adjustment and is held in any desired one by a locking arrangement consisting of a dowel pin operated by a hand lever or an ordinary latch. The live tailstock spindle is provided with an ordinary centering drill which is rotated in any of the customary ways. In addition to the rotative movement of the spindle, a longitudinal movement in the supporting bearings is provided. This is controlled by a lever fastened on the tailstock and having a yoke which straddles a grooved collar on the spindle.

In operation the tailstock is freed from its slide by releasing the locking mechanism, after which it is moved away from the operator by the rotation of the pinion. The shell forging is slipped upon the expanding mandrel, which is operated to grip the inside of the shell forging, which is then rotated in the usual manner. A reverse motion of the pinion moves the tailstock toward the operator and locks it in position with the centering drill directly in line with the axis of the headstock spindle. The drill spindle is then started rotating and the drill is fed into the base of the shell by the yoked feeding lever. After the drill has entered the work the required distance it is withdrawn and the tailstock unlocked and moved to bring the dead center directly in line with the axis of the mandrel. This center is now fed into the socket bored by the centering drill and is relied upon to provide a strong and stiff support for the overhanging end of the shell forging. The feed



The Three Operations of Cutting-off the Open End of a Shell Forging, Drilling a Centering Socket in the Base and Facing the Base, Are All Accomplished at One Setting in a New Shell Making Machine Equipped with an Adjustable Two-Spindle Tailstock Instead of in Three Separate Machines

screws of the cross slides are now rotated by the engagement of the clutches. This causes the cross slides to approach each other the same as ordinary lathe tools and bring the parting and facing cutters mounted upon them into contact with the rotating shell. When these cutters have entered the shell to the required depth, the clutches are automatically released by the adjustable collar and the slides are then backed away from the work. As soon as the cutters are clear the tailstock is moved out of the way and the shell removed from the mandrel.

The tailstock is mounted upon a slide and is operated by a rack and pinion, the latter being rotated by a handle or wheel attached to its shaft. The tailstock

screws of the cross slides are now rotated by the engagement of the clutches. This causes the cross slides to approach each other the same as ordinary lathe tools and bring the parting and facing cutters mounted upon them into contact with the rotating shell. When these cutters have entered the shell to the required depth, the clutches are automatically released by the adjustable collar and the slides are then backed away from the work. As soon as the cutters are clear the tailstock is moved out of the way and the shell removed from the mandrel.

At the recent annual convention of the Annual Association of Iron and Steel Workers held at Joliet, Ill., a resolution was adopted expelling all I. W. W. members.

New Members of the American Iron and Steel Institute

The following have been elected members of the American Iron and Steel Institute:

ACTIVE MEMBERS

Edwin F. Barnes, superintendent, American Steel & Wire Co., Worcester, Mass.
 Paul J. Kruesi, president, Southern Ferro Alloys Co., Chattanooga, Tenn.
 Clifton L. Lingo, Inland Steel Co., Indiana Harbor, Ind.
 Arthur H. Jameson, vice-president, Bayonne Steel Casting Co., Bayonne, N. J.
 James Duane, Jr., manager Carbon Iron & Steel Co., Parryville, Pa.
 Waldemar Dyrssen, metallurgist, United States Steel Corporation, 71 Broadway, New York.
 Ferdinand E. Canda, president, Chrome Steel Works, 11 Pine Street, New York.
 Charles A. Gould, president, Gould Coupler Co., 30 East Forty-second Street, New York.
 Orville P. Blake, Inland Steel Co., 593 Wilkins Building, Washington.
 S. Kuker, assistant treasurer, United States Steel Products Co., 30 Church Street, New York.
 Otway B. Newton, Virginia Iron, Coal & Coke Co., Roanoke, Va.
 Charles H. Forster, secretary, Superior Steel Corporation, 521 Union Arcade Building, Pittsburgh.
 Olof Tangring, superintendent, American Steel & Wire Co., New Haven, Conn.
 Peter Stewart, superintendent, American Steel & Wire Co., Worcester, Mass.
 Thomas McCaffrey, general manager, Brier Hill Coke Works, Brier Hill, Pa.
 J. Lester Perry, superintendent, American Steel & Wire Co., Worcester, Mass.
 Robert S. Lackey, treasurer Alleghany Ore & Iron Co., Buena Vista, Va.

ASSOCIATE MEMBERS

Joseph D. Billard, American Refractories Co., New York.
 Allan S. Bixby, manager, National Malleable Castings Co., Indianapolis.
 James V. Davison, vice-president, National Malleable Castings Co., Cleveland.
 James W. Donner, Dayton, Ohio.
 Grafton D. Dorsey, assistant manager, National Lead Co., 111 Broadway, New York.
 William M. Duncan, Alton, Ill.
 Otto J. Fehling, manager, National Malleable Castings Co., 2610 West Twenty-fifth Place, Chicago.
 William Garrow Fisher, president, International High Speed Steel Co., 99 Nassau St., New York.
 J. D. Forrest, general manager, Citizens Gas Co., Indianapolis.
 C. E. Gault, president, Perfection Metal Products Co., Mulvane Building, Topeka, Kan.
 George A. Hart, superintendent, National Malleable Castings Co., Melrose Park, Ill.
 Charles W. Hotchkiss, manager, National Malleable Castings Co., Cleveland.
 Carl T. Keller, assistant to president, Walworth Manufacturing Co., Boston.
 Saul Lavine, General Electric Co., Pittsburgh.
 Oliver W. Loomis, manager, National Malleable Castings Co., 7706 Platt Avenue, Cleveland.
 Charles W. McClure, vice-president William B. Pollock Co., Youngstown, Ohio.
 Porter Pollock, president William B. Pollock Co., 448 East Federal Street, Youngstown, Ohio.
 Harry W. Pratt, second vice-president, Naylor & Co., Inc., 120 Broadway, New York.
 E. W. Sheldon, president, National Foundry Co., Erie, Pa.
 Frank M. Sheldon, 239 Causeway Street, Boston.
 James A. Slater, National Malleable Castings Co., 311 Railway Exchange Building, Chicago.
 Loren B. Wilson, manager, National Malleable Castings Co., Front & Paine Avenue, Toledo, Ohio.
 C. W. Sherman, Dominion Steel Foundry Co., Ltd., Hamilton, Ontario.
 Lee D. Brueckel, Phillips Sheet & Tin Plate Co., 30 Church Street, New York.
 William Wuthenow, general superintendent, Republic Iron & Steel Co., McCormick Building, Chicago.
 Olin R. Kuhn, Midvale Steel & Ordnance Co., 1812 Oliver Building, Pittsburgh.
 Fred A. Bigelow, vice-president, Carpenter Steel Co., Reading, Pa.
 Roy C. McKenna, president, Canadian-Alloys Steel Co., Latrobe, Pa.

James E. Fitzgerald, Brier Hill Steel Co., Youngstown, Ohio.

Roy Carnahan, secretary, Carnahan Tin Plate & Sheet Co., Canton, Ohio.

Frank A. Robbins, Jr., general manager, Bethlehem Steel Co., Steelton, Pa.

Rollin W. Lusk, sales agent, American Steel Foundries, Pittsburgh.

G. F. Ahlbrandt, assistant general manager of sales, American Rolling Mill Co., Middletown, Ohio.

Charles Prescott Rees, superintendent, Ramapo Ore Co., Inc., Sterlington, Rockland Co., N. Y.

Wheaton Bradish Kunhardt, president, Carpenter Steel Co., Reading, Pa.

Allen Hoffer, Cleveland-Cliffs Iron Co., Cleveland.

George W. Whitehead, assistant superintendent, Lackawanna Steel Co., Buffalo.

Harry G. Uphouse, manager of sales, Donner Steel Co., Inc., Morris Building, Philadelphia.

Charles A. Menk, Carnegie Steel Co., Munhall, Pa.

Lee Deutsch, secretary-treasurer, Rome Iron Mills, Inc., New York.

William L. Hoffman, Brier Hill Steel Co., 703 Morris Building, Philadelphia.

William C. Dickey, Brier Hill Steel Co., 120 Broadway, New York.

William F. Vosmer, Donner Steel Co., 120 Broadway, New York.

A. A. Templeton, president, Detroit Seamless Steel Tubes Co., Detroit.

Robert McGregor, vice-president, Federal Shipbuilding Co., Kearny, N. J.

Charles S. Belsterling, United States Steel Corporation, 71 Broadway, New York.

Proper Quenching Point of Carbon Steel

Based on the fact that carbon steel at its non-magnetic point is at the best temperature for quenching for the purpose of hardening, an automatic detector has been perfected by Automatic & Electric Furnaces, Ltd., London, and is fitted to electric heat-treating furnaces. The furnace chamber consists of an inner pot which contains a special mixture of salts having a comparatively low melting point but a high vaporizing point. The pot is wound with a heating coil and is provided with a special heat-resisting lagging. Round the outside case of the furnace is wound an insulated copper coil, the ends of which are connected to a special galvanometer. A current of electricity, passed through the heating coil, quickly heats the furnace and renders the salt mixture molten and also magnetizes any steel article that is placed in the pot. When the steel has been heated to the non-magnetic point a small current is induced in the outer winding, and the consequent deflection of the galvanometer needle informs the attendant that the best temperature for quenching has been reached. A 4-in. furnace, it is stated, will harden 10 lbs. of tools, gages or other articles in an hour.

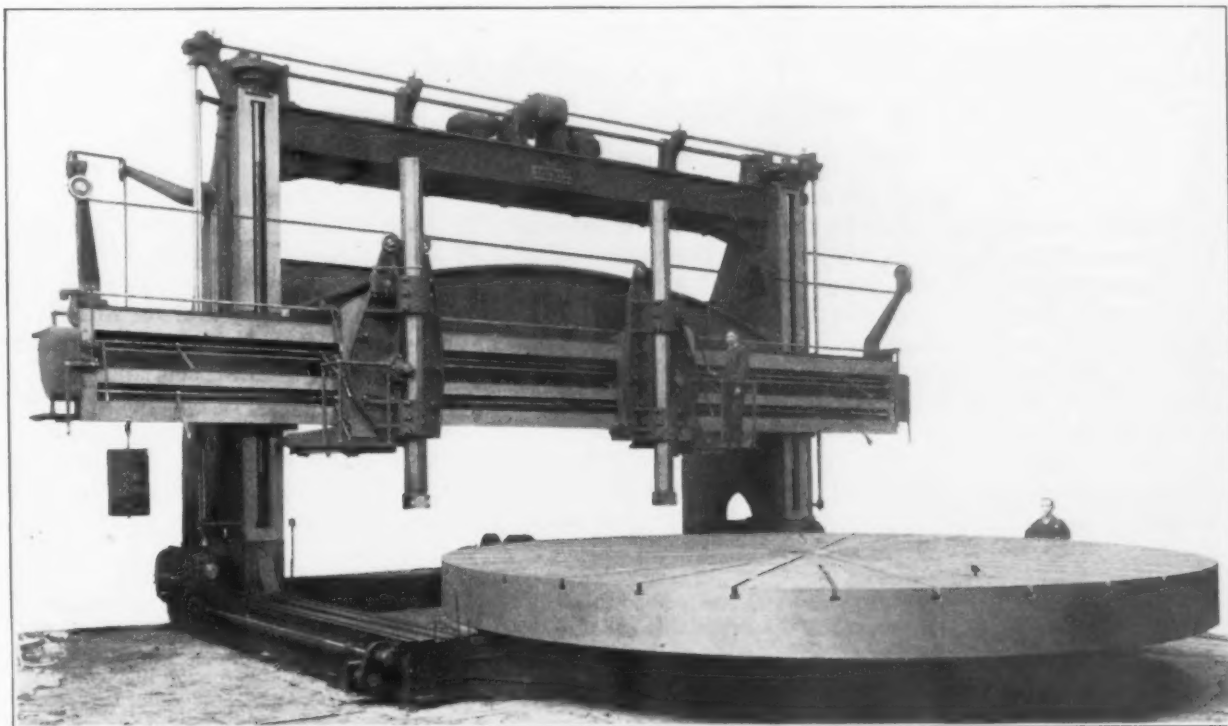
New Tool Steel Company

A new tool steel company, to be known as the Le-Moyne Steel Co., is to be established at Monongahela City, about 25 miles up the river from Pittsburgh. It is expected that high-speed steel will be available for sale in July. The plant will begin operations with a 2½ to 3-ton Heroult electric furnace. Among those interested in the company are E. W. Strong, American Vanadium Co., Pittsburgh, and E. N. Doty, who has been identified with the coke industry.

Receivers for the Camden Iron Works, Camden, N. J., through counsel for the company, former Judge J. H. Gaskell, will make application to the United States District Court on June 24, for permission to pay \$300,000 in dividends on unsecured claims against the company amounting to \$1,000,000.

The first pig iron produced in British Columbia from an electric furnace was run off Saturday, June 1, at the works of the Aetna Iron & Steel Co., Port Moody, B. C., which is making pig iron from scrap castings.

The Housings Are Adjusted by a Separate 15-Hp. Motor While One of the Same Size Provides Fast Power Traverse for the Octagonal Boring Bars and the Saddles.



Purchasing Agents Act on Catalog Conference

Following the national catalog conference, held in Chicago, May 22, at which approval was voted of the following sizes for catalogs—6 x 9 in., 7½ x 10½ in. and 8 x 11 in.—the standardization committee of the National Association of Purchasing Agents met and reviewed the arguments and results of the conference. The committee decided to urge that all catalogs intended for purchasing agents be made 7½ x 10½ in. In the conference the purchasing agents had expressed their preference for this size. The standardization committee also decided that to accommodate those who issue pamphlets and single sheets the following would be adopted for printed matter intended for purchasing agents:

Pamphlets and booklets made in half the standard size will meet the approval of the purchasing agent, provided they are saddle stitched so that when opened out they will measure 7½ x 10½ for convenience in filing. Thus booklets 5 5/16 x 7½ or 3¾ x 10½ will be acceptable.

Single sheets larger than 7½ x 10½, such as blueprints, maps and charts, will be filed in the purchasing agents standard file provided they will readily fold down to that size.

Single sheets or pamphlets of the 7½ x 10½ standard size may be folded for convenience in mailing but should be so made as to permit easy unfolding and filing by the purchasing agent.

The committee also indorsed the recommendation of the conference that paper for catalogs be confined to the sizes 25 x 38, 32 x 44 and 33 x 46, that weights based on 25 x 38 be limited to 40, 45, 50, 60, 70 and 80 lb. and that colors be restricted to white and natural.

Those who attended the conference who are in position to know assert that the movement when fully operative will conserve 30,000 people now used on hand processes because of lack of standardization and will save millions of dollars in the paper and printing industries.

The standardization committee of the Purchasing Agents' Association is as follows: W. L. Chandler, chairman, Dodge Sales & Engineering Co.; W. V. C. Bulkeley, Columbus Railway, Power & Light Co.; C. A. Woodruff, Saxon Motor Car Co.; R. E. Cowan, Ralston Purina Co.; N. L. Morse, Southern California Gas Co.; F. W. Hicks, Prest-O-Lite Co., and G. L. Winters, La Favorite Rubber Mfg. Co.

A Large Boring and Turning Mill

For handling work in arsenals, the Niles-Bement-Pond Co., 111 Broadway, New York, has recently completed a large extension boring and turning mill at the Hamilton, Ohio, plant of the Niles Tool Works. The normal swing of the machine is approximately 28 ft. with the housings in the forward position, and by moving them back it is possible to increase the swing to over 42 ft. Motor drive with push button control is employed throughout.

The table, which is designed to carry a load of 300,000 lb. in addition to its own weight, is driven by a 60-hp. motor through two forged steel pinions located one on each side of the table. This motor is controlled by the stations on each side of the machine and also from platforms on the cross-rail.

The cross-rail, which is elevated by a 25-hp. motor to give a maximum height under the tool holders of 10 ft., has two heads with octagonal bars measuring 10 in. across the flats and having a travel of 84 in. Platforms for the operator are provided at the heads on the cross-rail, which is 48 in. wide and 54 in. deep from front to back. The adjustment of the feeds and the rapid traverse for the bars and saddles which is provided by a 15-hp. motor is controlled from these platforms together with the main driving motor.



The Housings on a Large Motor-Driven Extension Boring and Turning Mill Can Be Moved Back to Increase the Normal Swing of 28 Ft. to 42 Ft.

Limiting the Impurities in Coal

Government Plans to Govern Quality and to Curtail Supply to Wasteful Plants and Possibly to Non-War Industries

WHAT was inconspicuously referred to as a fuel session in the program of the American Society of Mechanical Engineers, which held its spring meeting at Worcester last week, brought out some timely information which is calculated to be of lasting as well as temporary benefit to industry. A preliminary statement was made of the plans of the Fuel Administration to classify users of fuel from the standpoint of wastefulness and thus to control the supply of fuel to plants where it will do the most good; the society was asked to help in the definite determination of the limitation and cost of impurities in coal, thus to help in the enactment of laws which will prevent a marketing of impure fuel just as there are laws against impure foods and drugs; and there was the intimation in the meeting that before long it is to be expected that the Fuel Administration will deliver fuel first to plants engaged 50 per cent or more on war orders, so that plants less fully occupied on war business or not occupied at all will have to wait for fuel until the 50 per cent and over class is satisfied.

As noted briefly in the account elsewhere of the meeting the fuel session was planned by the fuel conservation committee of the Engineering Council. Discussion was asked on some twelve different topics with emphasis placed on contributing facts and not opinions. These topics were as follows:

- 1.—What are the Economic Effects of Impurities in Coal?
- 2.—To what Extent Is Fuel Oil Likely to be Used as a Substitute for Coal?
- 3.—How Can Soft Coal be Burned Without Smoke in Marine Boilers?
- 4.—What are the Possibilities in the Direction of the Utilization of Anthracite Wastes?
- 5.—What Instruments are Useful and Desirable in the Boiler Room?
- 6.—What Is Essential to the Economical Operation of Hand-Fired Boiler Furnaces when Using Soft Coal?
- 7.—To what Kinds of Plants and Coals are the Different Types of Mechanical Stokers Adapted, and what Is the Limiting Factor to their Use in Small Plants?
- 8.—What Experience Have You had in the Use of Wood as Fuel? To what Extent Is Wood Available as a Fuel?
- 9.—What Coal Economies can be Effected in Residence Heating?
- 10.—What Coal Economies can be Effected in the Small Steam Plants?
- 11.—What Experiences Have You had with the Storage of Coal?
- 12.—A Few Additional Topics:
 - (a) To what Extent and Where Will the Gas Products be Used to Produce Economies?
 - (b) To what Extent Is Natural Gas being Used as Fuel for Power Purposes?
 - (c) What Is the Relative Economy of the Locomotive of 1900 and To-day?
 - (d) What Proportion of the Coke Is Made in By-Product Ovens?
 - (e) What are New and Important Developments in Methods of Burning Coal?
 - (f) What Economies Have Resulted from Recent Practice in Making Brick Settings Leakless?
 - (g) To what Extent Is Coke being Used for Residence Heating?
 - (h) Is Automatic Air Supply Correctly Proportioned to Coal Supply Possible?

Prof. L. P. Breckenridge, Sheffield Scientific School, New Haven, Conn., is chairman of the fuel conservation committee, of which other members include Prof. R. H. Fernald, University of Pennsylvania; David Moffatt Myers, consulting engineer, New York, and now advisory engineer of the U. S. Fuel Administration; Prof. C. R. Richards, University of Illinois, and O. P. Hood, Bureau of Mines, Washington, who is secretary of the committee.

Curtailing Fuel to Wasteful Plants

Prof. Breckenridge presided and Mr. Myers opened the session. He described briefly the formation of the fuel engineering division under the conservation bureau, and the establishment of two departments, one devoted

to the railroads and the other to industries. Major Edward C. Schmidt is in charge of fuel conservation for the railroads under the direction of the Railroad Administration. So far as industries are concerned there is to be an administrative engineer in each coal-using State attached to the state fuel administration. This staff will include a force of inspectors. There is to be a personal inspection of every power plant, which is to be rated and classified in five classes and the supply of fuel to the needlessly wasteful plant will be curtailed or stopped. The movement has been ratified by the states consuming 70 per cent of the fuel used in industry. A standard set of recommendations and questionnaire is now in operation in Pennsylvania and in Connecticut. In New York State, Edward N. Trump, vice-president Solvay Process Co., Syracuse, N. Y., is administrative engineer; Thomas R. Brown is administrative engineer for western Pennsylvania and W. R. Corson, Hartford Steam Boiler Inspection & Insurance Co., is administrative engineer for Connecticut. In the educational program in this connection, films of motion pictures have been prepared to show good and bad plants in the matter of coal use. A list of competent engineers for the service has been prepared by the American Society of Mechanical Engineers. "Maximum production with minimum waste" is a slogan, Mr. Myers emphasized, and not the erroneous idea of shutting things down. In conclusion he emphasized that engineers capable of assisting in the program should send their names to the Fuel Administration.

Impurities in Coal

The first contribution on the subject of impurities in coal was made by Walter N. Polakov, consulting engineer, New York, in part as follows:

Coals with high percentage of noncombustibles were used by the author this winter in both hand and mechanically stoked furnaces. For instance, with a mixture of 1 part run of mine and 5 parts of anthracite screenings containing ice and water, 15 per cent; earthy matters, 28 per cent; oxygen, 2 per cent; a total of 45 per cent, never less than 60 per cent of boiler and furnace efficiency was obtained.

From a large number of observations with coals contaminated with noncombustible impurities, several conclusions may be drawn:

1.—While the efficiency of steam generation with so-called "war coals" drops from 10 to 25 per cent, improved boiler room management based on task work with bonus does invariably more than offset this loss.

2.—The steaming capacity of coal drops along a parabolic curve, that is, with the increase of ash content, the evaporation drops more rapidly in the beginning and more slowly when ash percentage is getting high; indicated in accompanying chart.

3—From this chart, it appears that the increase of ash contents from 14 to 18 per cent reduces the evaporation per 1 lb. of coal (12.5 per cent) and corresponds with the increase of ash content from 18 to 28 per cent. It should be noted that these data are obtained from a number of hand fired plants using mixtures of hard and soft coal for over 18 months period.

4—While the extra cost of haulage and extra expense for labor for handling coal and furnace refuse are easily estimated, the more important, though less noticeable, loss is due to difficulties presented for the admission of the proper amount of air into the furnace. If this is judged by the rate of firing (pounds per hour) excess of air is inevitable with coals high in ash; similarly, if direction is given by draft indications, extra resistance of fuel bed is likely to misguide the fireman; again, if adjustments are based on gas analyses, the improper velocity of gases through the boiler may lower the efficiency, ultimately at the expense of combined efficiency. Similarly, losses are incurred by more frequent cleaning of fires.

5—By far the greatest economic effect of impure coals is the misuse of rail and water facilities for transporting the harmful, or, at best, useless ingredients.

7—Half-measures toward preparation of clearer coal at the mines won't go half way in ameliorating the present car shortage and furnace wastes. By reducing ash percentage from 28 to 21 per cent, only seven cars out of every 100 will be released, yet by removing also the other half of impurities from coal (that is placing the quality of coal on the pre-war standard) the need will be satisfied with 78 cars out of every 100 now tied up.

Destructiveness of Sulphur

William S. Gould, president Fuel Engineering Co. of New York, called attention to the fact that the 544,000,000 tons of fuel produced in 1917 were equivalent in heating value to 476,000,000 tons in 1916, such is the decrease owing to the increase in percentage of ash. The loss due to increase of sulphur content, he added, was $1\frac{1}{2}$ per cent reduction in heating value for each 1 per cent addition of sulphur. He dwelt on the clinker troubles resulting from excessive sulphur and the heavy damage to grates. He told how a new grate with $3\frac{1}{2}$ per cent sulphur coal was entirely destroyed in 4 hr.

Government Pressure on Producers

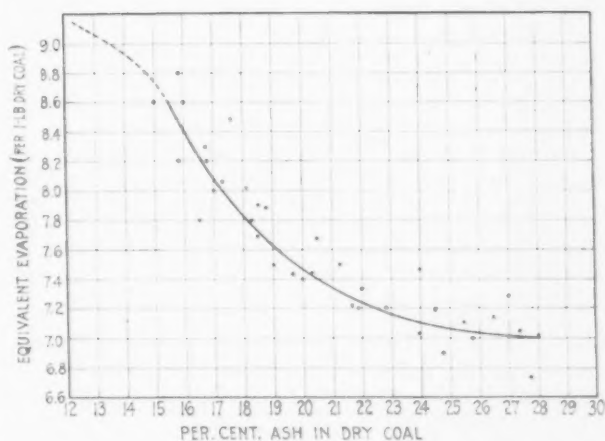
A presentation, which may be said to have been made in behalf of the Government and intimating the permanent likelihood that only fuel of a definite maximum impurity will be allowed to go on the market was made by E. L. Cole, secretary conservation division, Federal Fuel Administration for Pennsylvania. What he said was in part as follows:

With the steadily increasing demand for fuel caused by the rapid development of war industries, there was a noticeable increase of the amount of impurities in anthracite and bituminous during the winter months of 1917. Friendly suggestions were made to operators in the hope that the quality of coal would show improvement. It was a vain hope.

Because of the tremendous demand for anthracite it was thought wise not to limit the amount of impurities to the minimum of the pre-war standards. The schedule finally adopted, therefore, is slightly in excess of the amount of impurities shipped by the best anthracite producers in 1915.

The rulings governing the preparation of coal were made known to all anthracite producers. Responses were not so generous as anticipated by the Fuel Administration. Inspectors were then appointed with authority to condemn all coal found below standard. To accelerate the much needed reformation, William Potter, Federal Fuel Administrator for Pennsylvania, directed the speaker to supervise the inspection of coal at destination points within the State.

Less than $\frac{1}{2}$ per cent of the daily anthracite production of more than a quarter million tons was condemned by the Federal inspectors for the month of May. This coal was condemned at the mines and



Reduction of Evaporative Power of Coal in Terms of the Ash Content

re-prepared for delivery. More than 50 per cent of the marketed tonnage during January and February contained excessive amounts of impurities.

During the inspection at destination a car of buckwheat containing 45 per cent of impurities was delivered at a textile mill in Philadelphia. The fireman was unable to keep steam above 55 lb., normal steam pressure being 80 lb. Production at the mill fell off 30 per cent, and the cost of removing ashes increased 300 per cent. The coal company was compelled to rebate to the mill owner 50 per cent of the cost of the coal, together with equal percentage of the freight and cartage costs.

It is the observation of the Fuel Administration that steam sizes of anthracite containing 40 per cent are so inefficient in generating steam that the cost of such fuel is commercially prohibitory.

Steam sizes of anthracite containing not more than 20 per cent aggregate impurities enable firemen to maintain maximum steam under the most difficult conditions. When the amount of impurities exceeds 20 per cent there is at once a noticeably increased amount of fuel required to maintain normal steam pressure. In addition to this there is an increase of 10 per cent in the cost of fuel when the percentage of impurities is increased from 20 to 25 per cent and a further increased cost in the removal of ashes.

However, expert firemen obtain fairly good results with anthracite steam sizes containing as high as 30 per cent of slate and bone, but the fuel costs show an increase of 25 to 37 per cent above the cost of the same size fuel containing only 15 per cent of impurities. Any steam anthracite containing more than 30 per cent of slate is too expensive for the manufacturer to purchase to-day, according to our observation.

All steam coal containing more than 20 per cent of impurities is condemned when it comes under the observation of the Fuel Administration. This is so even when it is found at destination points in Pennsylvania.

Penalties Imposed on Coal Producers

Operators who deliver coal containing excessive amounts of impurities have been subjected to various penalties. Some cars were ordered hauled to the dumping grounds in Philadelphia; others were donated to hospitals and other non-profit-making institutions. A few cars were delivered to churches. Many cars en route to market were diverted back to the mines. In all cases the producing companies were compelled to pay the freight and other charges and donate the coal. This action by the State Fuel Administrator had a tremendous moral effect upon the producers and strengthened the arms of the Federal inspectors at the mines because publicity was given each case.

The effect of increase of impurities in domestic sizes of anthracite is much more marked than in steam sizes. No shipment of pea coal with more than 12 per cent slate is permissible. Chestnut gives best re-

sults when impurities do not exceed 5 per cent of slate and an equal percentage of bone (bone contains 50 per cent carbon). Chestnut coal containing 20 per cent of slate is so inferior that any price for such fuel is exorbitant. All nut coal containing 7 per cent of slate is condemned by the Fuel Administrator. Stove coal containing 5 per cent of slate and 6 per cent of bone gives maximum service. Egg coal should not be used when the amount of slate is more than 4 per cent and of bone 5 per cent. This size coal is difficult to burn unless it is virtually free from slate. The slate can be readily removed by the consumer.

It can be stated without question that bituminous containing more than 2 per cent of sulphur should not be used for locomotive purposes; 2½ per cent is the maximum that most standard railroads accept. More than 8 per cent of slate and other impurities makes the coal dear at any price.

Because of the heavy demand for bituminous the regulations are somewhat elastic, but the Fuel Administration is making strenuous efforts to govern shipments of bituminous to points where the various grades are most adaptable. Many bituminous as well as anthracite operations have been closed because of the inferior fuel shipped therefrom.

Data Needed on Cost of Impurities

At this point it may be well to offer the suggestion that the American Society of Mechanical Engineers take up the task of obtaining data on the commercial cost of impurities of fuel. Recommendations should then be formulated by the Society to the Fuel Administration that may crystallize into legislative enactment that will make it a crime for unscrupulous producers to unload on consumers inferior product in much the same way as manufacturers of food are prohibited from delivering to our tables product unfit for human consumption.

The essential need of authoritative data on this subject is emphasized by the attitude of some producers. Last Monday the president of one of the largest anthracite producing companies urged that the percentage of impurities in anthracite be increased 2 per cent above the existing standard. When you are told that this will result in delivering annually to consumers at least 1,500,000 additional tons of slate and dirt, at the highest prices ever obtained in the markets, you will readily agree that it is imperative that incontrovertible data should be at hand to sustain and make permanent the present standards governing anthracite deliveries.

To haul the proposed 2 per cent increased allowance of impurities would require about 40,000 railroad cars for a period extending from two to 10 weeks. The benefit of delivering 1,500,000 tons of slate and dirt would result in adding to the profits of producers to the extent of at least \$6,000,000.

The plea for this proposed allowance is based entirely upon the decreasing labor supply and the increasing needs for anthracite, but as shown, to permit additional impurities would really increase the volume of fuel production, but decrease the value of fuel delivered to consumption points. The Fuel Administration for Pennsylvania is giving serious consideration to some other method of increasing production without increasing the amount of impurities permitted in coal. Any honest suggestion for increasing anthracite production by lowering the standard of preparation should be accompanied with an offer to reduce the market price in exact ratio to the decreased fuel value of the product.

It is expected that rulings standardizing the quality of bituminous will be issued at an early date.

The speaker is authorized to say to this society that William Potter, Federal Fuel Administrator for Pennsylvania, pledges himself and his administration to aid any measures undertaken to insure to consumers, industrial and domestic, reasonably clean coal as a permanent institution in the United States. Because the anthracite production is confined to Pennsylvania, the responsibility for overseeing the quality of production

rests largely on the shoulders of State Administrator Potter.

Large Pieces of Stone in Coal

A. J. German, Scovill Mfg. Co., Waterbury, Conn., told of the breakage of crushers and troubles with stokers owing to the large amount of slate, rock and earth supplied in coal. In the case of three cars of 45 tons capacity, 9000 lb. of impurities were removed from the top of these cars. One of the rocks, for example, measured 4 ft. x 2 ft. 5 in. x 6 in. The rest had to go through the crushers. The result was six large gears were broken and three shafts, but now the crushing equipment is provided with overload release. There is still considerable trouble from dirt on the chain grate stokers used. He explained how by modifying the shape of the hopper it was possible to minimize this loss.

Thomas A. Marsh, chief engineer Green Engineering Co., East Chicago, Ind., related experiences with Iowa coal and lignites, high in non-combustibles. In the case of lignites of about 43 per cent non-combustible, developing 7000 to 8000 B.t.u. per lb., the fuel had been burned at the rate of 35 lb. per sq. ft. of grate, but the efficiency was 65 per cent. Robert H. Kuss, consulting mechanical engineer, Chicago, said that for each 1 per cent of ash the efficiency is reduced ½ per cent.

Government Limiting of Impurities Endorsed

R. J. S. Pigott, Bridgeport Brass Co., Bridgeport, Conn., maintained that the efficiency of the boiler room may be maintained with the impure coal by means of mechanical handling, but the capacity is reduced and capacity at this time is most serious, and besides it is difficult to get the apparatus. The hand fired plants suffer the most and need the consulting advice from the Fuel Administration. At this point Mr. Pigott offered a resolution which was adopted, endorsing and supporting the Fuel Administration in the activities as told by Mr. Cole, representing the Pennsylvania fuel administration.

Fuel Oil as Coal Substitute

On the subject of fuel oil as a substitute, A. C. Bedford, chairman of the board of directors of the Standard Oil Co. of New Jersey and chairman of the Petroleum War Service Committee, said that 50 per cent of the oil is going to the Government fleets and the Allies, and that while there is an unlimited supply in Mexico, it is not obtainable. There will be hardly enough after taking care of the war fleets and the peoples abroad, he added, to take care of industry under the twelve priority divisions. Of the 30,000,000 bbl. to be consumed along the Atlantic seaboard in the current year about 25,000,000 bbl. will go to gas companies and munition makers. He advised against the use of oil under boilers and locomotives as not relatively efficient and that oil users should if possible maintain a 60 days storage. Finally he encouraged the meeting to believe that whatever is essential will be taken care of.

Mr. Pigott said that measured in terms of the heat in the steam oil cost twice as much as coal. He had found in the matter of oil forge fires an efficiency as low as 10 to 15 per cent. This is chiefly the result of the high flame temperature used on a cold product and a short passage for the products of combustion, when instead the articles to be heated should be preheated and if possible the counter current system of heat exchange be employed.

Hard Pitch as a Coal Substitute

Robert H. Kuss described the burning of hard pitch, produced as a residue in tar products manufacture and regarded as available, for example, for open-hearth furnaces. Depending upon developments in the business, there may be large tonnages of hard pitch produced in this country, he added, in which case it will be exceedingly important to find an outlet for its consumption by burning. In the instance now being developed it is definitely established that hard pitch of a melting point beyond 200 deg. Fahr. can be successfully

prepared and burned either as pulverized fuel or in a liquid state.

The best progress has been made thus far in burning the pitch in liquid form under the following conditions:

1.—Furnace construction identical with that for fuel oil burning.

2.—Burner identical with fuel oil burner, with the exception that special means of introducing the fuel into the burner are desirable so that no parts of the oil piping are exposed to atmospheric temperatures.

3.—The pitch can be successfully conveyed in piping without coking at temperatures ranging between 450 and 550 deg. Fahr.

4.—The enveloping piping conducts air (in place of steam, commonly used in oil burning practice) at a temperature of the same range as that of the melted pitch, the circulation being maintained by discharging at the burner end sufficient heated air to care for about one-tenth of the air needed for combustion.

5.—The pitch melting system consists preferably of an auxiliary fire delivering heated gases to a chamber containing coils for the heating pipe line air, and three tanks whose functions are as follows: A large hard pitch melting tank operated at atmospheric pressure discharging, as needed, melted pitch into an intermediate tank of less capacity; the intermediate tank is so piped and valved as to be capable of operating at atmospheric pressure with the melting tank or a higher pressure (around 80-lb. gage) with the third tank; the third and smallest tank always operates at the firing pressure and supplies the burner pipe lines. Sources of waste heat may eliminate the auxiliary fire feature.

6.—The hard pitch burning system is especially applicable to metallurgical processes like the open hearth where a small or negligible quantity of sulphur and a very small quantity of ash are desirable.

7.—The burning of liquid pitch is still in an experimental state but bids fair to constitute an important adjunct to our high grade fuel resources.

Tests on Fine Anthracites

L. P. Frey, Lehigh Coal & Navigation Co., Lansford, Pa., gave the figures of some tests on burning fine anthracites. For example, with hand firing, a No. 1 buckwheat gave an efficiency of 74 per cent and 200 per cent of the builder's rating, but No. 5, which is an unclean silt, costing one-third of No. 1, gave a 45 per cent efficiency. Under conditions of stoker practice and straight forcing, a No. 4 coal gave 61 per cent efficiency and 200 per cent of rating with an equivalent evaporation of 6.9 lb. of steam per pound of coal. His advice is to put not more than 20 to 25 per cent hard coal in the soft coal with natural draft and not more than 35 per cent when the draft is forced. He suggested utilization of briquets which can be bought at low cost.

A good deal of emphasis was also placed in the discussion on the necessity of pretty thorough mixing. On what is essential in using soft coal in hand fired furnaces, contributions were received from Henry Kreisinger, Bureau of Mines, Pittsburgh, among others, and George H. Diman, Lawrence, Mass.

On the matter of sizes of plants in which stokers are justifiable, Mr. Marsh asserted that a 500-lb. plant can be fired by hand with smokelessness and low fuel cost, while O. C. Woolson, designing engineer, New York, does not believe in establishing any limit to the size of a plant, believing that even a 60-hp. outfit might justifiably be provided with a stoker. Carl Smerling, president Huber Hand Stoker Co., Inc., New York, argued for the place in the power plant of the hand stoker.

The Eastern Brass & Ingot Corporation of New York, Waterbury, Conn., is converting cartridge case turnings into the form of circular blocks of metal measuring from 3 to 3½ in. in diameter, and from 1½ to 2 in. in thickness. The blocks, which weigh from 3 to 5 lb., are produced without using heat or binding material.

SPEEDING RIFLE PRODUCTION

More Now Being Turned Out than the Government Requires

WASHINGTON, June 11.—As the result of a general speeding up movement inaugurated by the manufacturers early in the present year the production of rifles for the United States Army has passed the million and a half mark. A report from the office of the Acting Chief of Ordnance, Brig.-Gen. C. C. Williams, shows that since the United States declared war against Germany, there have been produced 1,568,661 rifles. These include model of 1917 (modified Enfields), 1,140,595; model of 1903 (Springfields), 176,796; and Russian rifles, 251,270.

Spare parts for the repair of rifles in service have also been manufactured equivalent to 100,000 complete Enfields and an equal number of Springfields. All these rifles and parts with the exception of the Russian rifles, which are being used for training purposes and for the equipment of home guards, go into the hands of soldiers destined for France.

Besides the rifles made since war was declared there are 600,000 Springfields, model of 1903, in use. Inasmuch as only about one-half the soldiers in an army carry rifles, the Ordnance Department has a sufficient number, Springfield and modified Enfield, for an army of about two million men, allowing wastage for one year. Experience on the western front has demonstrated that the wastage in rifles is far less than was estimated in the early months of the European war when certain British authorities declared that four or five rifles per man would be required to supply troops continuously engaged in military operations.

Rifle production has proceeded at so rapid a rate during recent months that the factories are now able to turn out more than the Government requires. Last week's total production was 35,640 rifles, or a daily average of 5940. This figure was reached with only five plants busy, of the eight that have been working on rifles. Higher records were made when all the plants were working a short time ago. Some of the plants have been slowed up on rifles and put to work on machine guns and automatic pistols. Ninety thousand men, women and children have been engaged in rifle making.

Quantity production of rifles is successful, experts pronouncing the modified Enfield one of the best rifles now made. Tests are being conducted regularly to make sure that standards are maintained. A report received recently from a test at Camp Upton shows that in the firing of 850,000 rounds of ammunition with the 1917 modified Enfields, there were only three minor accidents and practically no malfunctions.

British Interests in French Iron Mines

With a nominal capital of £17 the French Iron Ore Co., Ltd., has been registered to exploit the iron-ore deposits of Brittany and Normandy. The directors include M. Mannaberg (Appleby Iron Co.), Col. J. R. Wright (Baldwins), Sir Hugh Bell (Bell Bros.), J. Williams (Bolckow, Vaughan), B. Talbot (Cargo Fleet), J. B. Allan (David Colville & Sons), G. Ainsworth (Consett Iron Co.), Lieut.-Col. W. D. M. Thomson (Dorman, Long & Co.), F. Mills (Ebbw Vale), H. Steel (Frodingham), E. Stear (Guest, Keen), H. Hall (Palmers), F. W. Cooper (Partington), W. Thornycroft (Steel Co. of Scotland), G. A. Mitchell (Stewarts and Lloyds) and W. H. Hewlet (Wigan Coal & Iron Co.).

The Inter-State Pattern Manufacturers' Association has been organized and will have headquarters at Columbus, Ohio. The association was formed to promote closer business relations between firms engaged in the production of wood and metal patterns. The Columbus office will be in charge of T. T. McQuire, who was elected secretary of the organization. E. F. Ball, of Newark, Ohio, was chosen as president.

Effect of Phosphorus on Soft Steels*

Only Increased Hardness Caused in Acid and Basic Open-Hearth Steels by High Phosphorus Content—Higher Tensile Strength

BY J. S. UNGER

THE purpose of this investigation was to compare soft acid and basic open-hearth steels of varying phosphorus content, and of as nearly the same composition in other respects as it was possible to secure in a practical way, to determine what differences would be obtained by means of different mechanical tests, particularly by fabricating finished articles requiring severe cold working for their production.

Every metallurgist knows that phosphorus adds hardness to steel in the same manner that carbon or any true hardening element does. Many persons believe that, in addition, it produces brittleness, or what is called cold shortness. Soft or low carbon steels are made up in the cold state into many articles requiring severe stamping, pressing, drawing, bending or upsetting operations. Articles of medium or high carbon steel requiring such operations are usually worked hot,

84 tons in all, were used in this experiment. The normal composition of each steel is given in Table 1.

After the first three basic ingots had been poured, sufficient 17 per cent powdered ferrophosphorus was added during the pouring of the next three ingots to increase the phosphorus to 0.030 per cent. To the following three ingots the addition was increased to show a phosphorus content of 0.055 per cent, the next three to 0.085 per cent and the next three to 0.110 per cent phosphorus. The same method was adopted in the ingot additions to the acid steel excepting that only three sets of three ingots each had additions of ferrophosphorus made to them, as the original phosphorus in the steel was higher to begin with.

The ferrophosphorus additions to the last set of ingots of each steel raised the phosphorus considerably above that regularly found in either acid or basic open-hearth steel, but these additions were made to secure steels containing as much phosphorus as is ordinarily found in Bessemer steel. Any higher phosphorus content than that found in Bessemer steel was of no practical value, consequently, a study of steels containing higher percentages of phosphorus was not considered.

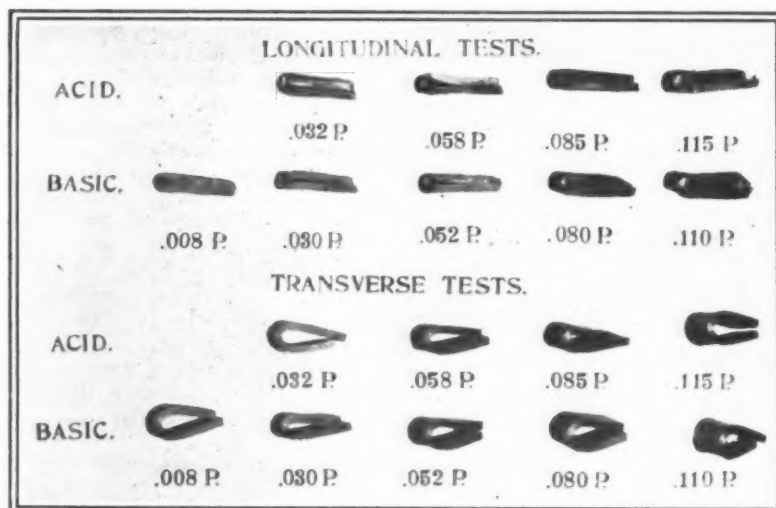
The method described furnished steels practically alike in every particular, except in the amount of phosphorus they contained; therefore any differences found in the tests or finished products could be attributed to the phosphorus content. All the phosphorus in the ferrophosphorus was absorbed by the molten steel without appreciable loss. The amount of phosphorus found in the ingots and the various steel articles checked the phosphorus additions very closely.

The ingots were stripped and charged hot into the soaking pits, heated and rolled in the regular way into billets, slabs and sheet bar. A

discard of about 25 per cent was made from the top of each ingot. None of this material was chipped after rolling and no difference was observed between the different ingots in the rolling mill. These semi-finished products were then shipped to the various mills to be rolled into sheets, wire rods and rounds, from which the finished articles were made.

Physical Tests

Longitudinal and transverse tensile, cold bending and drifting tests were made on the sheet bar, which was 0.467 in. thick. Tensile, vibratory and impact tests



Bend Tests of Acid and Basic Open-Hearth Steels of Varying Phosphorus Content. The specimens were 8 x 2 x 0.467 in.

giving very little opportunity to observe their properties until after they have become cold.

Soft steels for use in articles requiring severe cold working in their production are rarely tested by means of physical tests, the fitness or unfitness of the steel being determined by the ability to fabricate the steel and meet the requirements of ordinary service. For this reason more attention was given to the fabrication of finished articles in this investigation, although physical tests of various kinds were made.

Large numbers of the several articles were made up cold in a practical way, the aim being to carry out the experiment in accordance with current conditions, being careful not to change the shop conditions or methods of operating. By making a considerable number of each article, a fair average result was obtained.

The steels were not given any special heat treatment, excepting such as is regularly given to ordinary soft steels; for instance, the annealing of sheets or the pickling and annealing of wire. The effects of heat treatment were not studied, as soft steels are rarely heat treated. A few tensile and other tests were made on some heat-treated bars for information only.

Twelve ingots from the same heat of acid steel and 15 from the same heat of basic open-hearth steel, or

Table 1—Composition of the Steels, Ladle Analysis

Kind of Steel	Carbon, Per Cent	Manganese, Per Cent	Phosphorus, Per Cent	Sulfur, Per Cent	Silicon, Per Cent	Copper, Per Cent
Acid open hearth,	0.12	0.36	0.032	0.036	0.020	0.014
3 Ingots			0.058			
3 Ingots			0.085			
3 Ingots			0.115			
Basic open hearth,	0.12	0.36	0.008	0.037	0.022	0.012
3 Ingots			0.030			
3 Ingots			0.052			
3 Ingots			0.080			
3 Ingots			0.110			

were made on the untreated and treated 1-in. rounds and, in addition, shearing tests were made on the same material, untreated. Longitudinal and transverse speci-

*Abstract of a paper presented at the fourteenth general meeting of the American Iron and Steel Institute in New York, May 31, 1918. The author is manager central research bureau, Carnegie Steel Co., Pittsburgh.

mens from sheets 0.096 in. thick were tested by alternate bending, and specimens from sheets 0.048 in. thick were tested for their drawing qualities by the Erichsen test. Tensile tests were made on both the wire rod and the wire.

[The results of all these tests are given in detailed tables in the original paper.]

The tests on sheet bar stock, 0.467 in. thick, were made in duplicate. With the same phosphorus content, the acid steel shows approximately 3000 lb. higher ultimate tensile strength than the basic. On account of the width of the sheet bar the transverse tests were pulled in 2-in. sections and calculated to 8 in. for comparison. Longitudinal and transverse bends were made on the same material. All longitudinal bends closed up flat without showing any cracks on the outer surface. The transverse bends were closed until slight cracks could be seen, the bending then being stopped. The bent specimens are shown in one of the illustrations.

Vibratory and Impact Tests

The vibratory tests were made on specimens $\frac{3}{8}$ in. in diameter by 6 in. long. The specimens were gripped 4 in. from one end and vibrated $\frac{3}{8}$ in. in each direction at 650 vibrations per min. until failure occurred. The specimens were long enough to make a test at each end.

In the impact tests a standard S. A. E. specimen, 10 mm. sq., notched 2 mm. deep and 1 mm. wide, was tested with a 200 ft.-lb. pendulum machine, without being able to break the specimen, as they were so tough they would bend over and wedge under the tup. Repeated trials by cutting the notch 5 mm. deep did not improve matters. The notch was finally cut $6\frac{1}{2}$ mm. deep and turned away from the tup, when a clean break was obtained.

The writer's previous experience with both vibratory and impact tests has led him to place little confidence in either test, and the present tests have not proven an exception. These tests, particularly the impact tests, were made to try to show that the higher phosphorus steels were brittle under a dynamic or shock test. Nothing seems to be indicated by the conflicting results and nothing is claimed for them, excepting that they have not shown any greater brittleness on the high phosphorus than on the lower phosphorus steels.

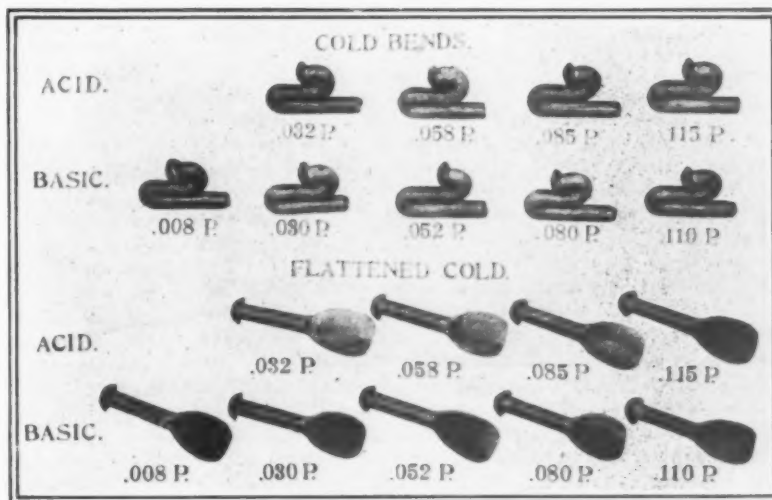
Tests on Rivets and Threading

Several rivets 12 in. long from each grade of steel were cold flattened to $\frac{1}{4}$ in. thick, as shown in one of the illustrations, no cracks developing on the flattened edges. Additional rivets were gripped under the head in a strong clamp and bent into a rough shape like the letter S, afterwards being closed up tight under the steam hammer, to try to snap the head off or break the rivet by bending under cold impact. No cracks developed on bending.

To determine what differences might exist in the finish and power required in machining, threading tests were made in duplicate on bars 1.016 in. in diameter, in the as-rolled condition and after heating to 900 deg. C. and quenching in cold water. A die cutting 14 threads per in. was equipped with a lever to which a dynamometer was attached to measure the pull in pounds while cutting the threads.

Cold-Drawn Shafting

Duplicate rolled rounds 30 ft. long and 1.016 in. in diameter were pickled at one time in the same acid solu-



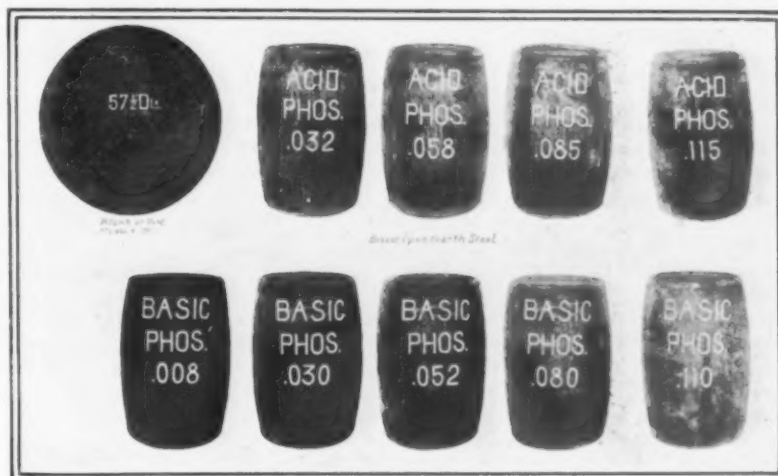
Cold Bends and Flattened Tests of Steel Rivets from Low to High Phosphorus Content

tion and then drawn into rounds 0.933 in. in diameter. The noticeable thing was the greater action of the pickling acid as the phosphorus increased. This is shown in the gradually decreasing diameters and the condition of the surface of the bars before drawing. This was pronounced enough to enable one to tell the phosphorus content by the diameter of the bar after pickling. After drawing, straightening and inspection, every experimental bar was commercially perfect and was applied on current orders.

Wire Products

Three 4 x 4-in. billets of each grade were rolled into wire rod, then drawn into wire of various sizes and used to make 1-in. 10-jaw barb roofing nails with 7/16-in. heads; button-head rivets, length 1 in., diameter of shank $\frac{3}{8}$ in., diameter of head $\frac{5}{8}$ in.; flat-head rivets, length $\frac{5}{8}$ in., diameter of shank $\frac{3}{8}$ in., diameter of head $\frac{7}{8}$ in. and thickness of head 0.145 in. In drawing the wire it was found that the steel was harder to draw and more breaks occurred in drawing as the phosphorus content increased.

In making the roofing nails, it was necessary to regrind the hammers more frequently than on regular dead-soft open-hearth stock, as the wire was harder to head up. Outside of this trouble all grades were made up into perfect roofing nails. In heading the button-head rivets the results were erratic, due probably to some small difference in the operation. It can be said in a general way only, that the harder the steel the greater the difficulty in heading the rivet. The flat-head rivet was a very severe upsetting operation. It may be called a dynamic upsetting test and unless the steel is very soft it will not produce a head free from cracks at the edges. For purposes of comparison a dead-soft basic open-hearth regular steel of about



Steel Barrels, of 55 Gal. Capacity, Made from Steels of Various Phosphorus Content

0.06 per cent carbon was carried along with the experimental steels.

Steel Barrels

Slabs of each grade of steel were rolled into sheets 0.130 in. thick, sheared into disks 57½ in. in diameter and fabricated into 55-gal. gasoline or oil barrels. The process of manufacture into barrels consisted of four straight drawing operations with intermediate annealing and pickling, followed by three final operations, consisting of bilging, forming the chine and curling the edge. A total of 215 disks were used, of which eight had to be scrapped, six of which were due to defective sheets, one to mechanical operation and one due to cracks developing during drawing, making a total of 207 barrels, which were tested with air for leaks and accepted.

One illustration shows a sample disk and one barrel of each grade of steel, and Table 2 gives the number of each kind made and the practice on the same.

Table 2—Results with Steel Barrels

Kind of Open hearth Steel	Phos- phorus, Per cent	Number Pieces Tested	Number Good Barrels	Per cent Good Barrels
Acid	0.032	24	23	96
Acid	0.058	24	24	100
Acid	0.085	24	24	100
Acid	0.115	24	23	96
Basic	0.008	24	22	92
Basic	0.030	23	23	100
Basic	0.052	24	22	92
Basic	0.080	24	24	100
Basic	0.110	24	22	92

No trouble was experienced in the manufacture of automobile running-board shields from any grade of steel, and the total number of 285 pieces, or approximately 32 pieces of each grade, were made into finished shields and used with the regular material in the manufacture of cars. In fabricating these shields most of the trouble is experienced in turning over the edge along the curved portion at the top of the shield, but none of the experimental steel cracked.

Conclusions

The results of this investigation speak for themselves. None of the steels showed brittleness under cold working due to the phosphorus. An examination of the results of the various mechanical tests, cold bending of the rivets under a hammer, the severe upsetting in making large headed nails or rivets, or the fabrication of barrels, automobile parts and cream separator bowls indicates nothing more than an increased hardness due to increase in phosphorus. This condition remains the same regardless of whether the force was applied slowly or statically, or if applied by shock or blow.

The results show that in soft steels an increase in phosphorus of 0.01 per cent is equivalent to an increase in tensile strength of about 850 lb. per sq. in., which is practically the same as would be obtained by increasing the carbon 0.01 per cent. Hence, higher phosphorus, soft or low carbon steels can be used for various purposes, provided the carbon content is decreased sufficiently to compensate for the increased hardness due to the phosphorus.

A Titanium-Silicon Ferroalloy

N. G. Petinot, of the United States Alloy Corporation, New York, has been awarded a patent (U. S. 1,260,037—March 19, 1918) on an alloy for use in steel making and it has been assigned to the company. The alloy contains titanium, silicon and iron. Because of its constituents and their chemical combinations the alloy aids in the refining of molten iron or steel, particularly by the removal of imprisoned slag or oxides. Its composition calls for a ratio of titanium to silicon of not less than 80 parts of titanium to 20 parts of silicon and not more than 85 parts of titanium to 15 parts silicon. The patentee asserts that if the titanium and silicon are in proper proportions, the titanic oxide and silica formed will combine with the slag or oxides which are imprisoned in the mass of molten steel, forming silico-titanates having low melting points, which readily float out of the steel.

HOBBS AND HOBBING*

The Application of This Method to the Commercial Production of Gears

The method of producing gears by hobbing has been understood in its theoretical aspects for many years, but conditions, which are now radically changed, delayed its general adoption until recently. One of these was the fact that quantity production as it is now understood did not exist, and quantity production is the field to which the hobbing process is especially adapted. The manufacture of the automobile on a large scale necessitated the production of duplicate gears in great quantities and gave the hobbing process a chance to show its capabilities, although its field was, in a considerable measure, restricted to the roughing operation alone. Prior to the advent of the hobbing machine gear cutting machines have always been operated on an intermittent principle. The rotary disk cutter method using formed milling cutters while it gave a continuous cutting action is nevertheless open to the objection that the heating effect is concentrated at one side of the blank, the first cut being made in a cold blank, while the last one is with the blank at a considerably higher temperature, necessarily resulting in inaccurate work.

An ideal system for producing gears should have a continuous cutting action, generation of each tooth by a single tooth or tooth profile, distribution of the cutting action around the blank and continuous indexing. The author points out that in the hobbing process the cutting action is continuous, each tooth in the gear is generated by the same set of teeth in the hob, both the work and the cutter rotate rapidly, thus assuring uniform distribution of heating and expansion and the indexing is continuous by rolling. It is pointed out that by making a specialist of a machine, while limiting the range of work to which it is applicable, makes it profitable for quantity production, since the efficiency on the work within its range is increased.

In designing a machine which would cut gears 12 in. in diameter with a diametral pitch of three, a machine of the horizontal work spindle type possesses many advantages. Among these are the quickness with which the work can be loaded, as well as the stiffness that can be built into the means for supporting the work. Cleanliness, too, is another feature, as the chips fall clear of the work support and do not hinder speedy reloading nor impair the accuracy of the results. The hob support should be arranged with a minimum overhang and the hob should be so mounted that it can be set at an angle to cut both spur and helical gears. Lateral adjustment without disturbing the hob on the arbor should be provided so as to bring successive places into the cutting range, thus distributing the wear.

The hob which is formed and not ground is recognized as the proper tool for roughing, and it may still be used for some classes of finishing where a high quality of output is not required. To enable the hob to be used for accurate finishing operations careful grinding is resorted to to overcome the inaccuracies introduced by hardening. At the present time the superiority of the process is greater in finishing than in roughing.

Other applications of hobbing, such as the production of splined shafts and ratchet and slotting saw teeth, etc., are mentioned.

The Reliance Steel & Tool Co., dealer in drills, reamers, taps and dies, milling cutters, etc., is now located at 24 Murray Street, New York. This company, formerly at 30 Church Street for a number of years, moved to 54 Dey Street about a month ago. When the Government took over the Dey Street premises, the company was compelled to seek new quarters.

*From a paper presented by F. G. Hoffman at the recent meeting of the American Gear Manufacturers' Association. The author is sales manager, Barber Coleman Co., Rockford, Ill.

A VESTIBULE SCHOOL

The Training Department in Operation at Plant of Norton Grinding Co.

A paper on the general subject of vestibule schools was read before the American Society of Mechanical Engineers on June 6 by J. C. Spence, Norton Grinding Co., Worcester, Mass. It was in part as follows:

The Norton Grinding Co. realized in 1915 the uselessness of attempting to hire skilled men in a community crowded with business and started a training department. What we have done is very simple and can be duplicated by any factory practically without cost.

We have not a true vestibule school, as such a school is an adjunct of the employment department and is used principally as an examination room for applicants. We call our school a training department.

To start a training department only two things are necessary: 1. A manager who really wants to help the United States to win this war to the extent that he will do his share of the breaking in of the rookies of industry. 2. A workman or foreman who has the knowledge and especially the patience to keep everlastingly teaching green help.

The Lack of Floor Space Objection

The first objection raised by most managers whom I have tried to interest in this question is that they have neither the necessary equipment nor the floor space. I am talking now of machine tool shops. This is a natural first thought, but is wrong for this reason: In every department in a machine tool shop there is a certain amount of simple work to be done. This applies even to the tool room. It is the custom to give this simple work to the less skilled men, and to use the older machine tools, thus allowing the more valuable men to do the better work.

This being so, then why not simply take a lot of these machines, some of every variety, and concentrate them in one department? Some rearrangement of the shop may be necessary but, on the other hand, this is usually a blessing, as most shops profit by frequent well-studied movings.

Start in a small way, with one leader and only a few students. It may be necessary to overcome a deep-rooted resentment on the part of those foremen and workmen who served a long term apprenticeship against any presto-change method of producing help. This may be met by starting in a small way and by letting it be thoroughly understood that the school is not intended to attempt to produce real machinists, but simply to take from the shoulders of the foreman the hard preliminary work of breaking in green help.

We do not attempt to make specialists in our training department. The student is given a little of all of the common machine shop operations. We do not know which department in the shop a given student will probably work in. We simply wait for the opening to occur and then the head instructor furnishes the student whom he thinks is best fitted for the job, regardless of the length of time served in the training department. The last man in might be the first man out, depending on what qualifications the job calls for.

Working on Odd Jobs

The training department runs along as a department of the shop, having its own schedule to meet in the production of simple parts and assembled mechanisms. This schedule calls for about one-half of the available labor of the department. The work, to fill in the balance, is picked up throughout the plant in the form of odd jobs. It is really surprising, in times like these, how the foremen welcome an odd job department. Here they get rid of all of the one-piece bothersome things that make fine jobs for the beginners, as they usually call for the use of several different kinds of machines.

The tool room also turns over much of its roughing work, as, for instance, the making of milling cutters, taps, reamers, arbors, etc., up to the very final operations that require experienced men.

If, by chance, the training department runs low in the right kind of work; that is, work that gives training in many branches of the trade, the head instructor has the right to commandeer any job in the main shop, no matter whether or not his department is equipped to do that job in an economical manner. For instance, if it were necessary to get some work to train men in the cutting of threads in an engine lathe, we go so far as to take work away from a turret lathe, even though the resulting threads show on our cost sheets to have cost us ten times what they ought to. It's a good deal cheaper in the long run for any of us to pay a little as we go along than to continually pay for the kind of help we are stealing from each other.

Not an Argument for Low Wages

This is not an argument for low wages. It is an argument for intelligence at high wages, resulting in less cost per piece. We pay an adult, who has had previous experience, at some kind of work, like driving a grocery team, the prevailing wage for common labor. Just now, in the Worcester section, this is 35 cents per hour. With our 55-hr. week this amounts to \$19.25, which is an inducement for many men, especially as there is the additional advantage of being able to make a good start toward learning the machinist's trade. We also take youths of not less than 16 years, paying according to experience and outlook.

About a year ago France made it a law that each factory employing 300 people or more should maintain a separate training department. Great Britain on the outburst of the war tried to supply help through putting new workers on the machines, as we have always been accustomed to do, but soon found that the great numbers of newcomers swamped the old. The technical schools were resorted to, but they were abstract, academic and unacquainted with production requirements. Then school directors were replaced by factory managers, with foremen in charge of departments under these directors.

Finally British and French manufacturers came to see as we must now see that the obligation to produce war products in quantities implies another and equal obligation; that is, the production by systematic training of mechanics who will produce the war requirements.

Electric Steel & Forge Co.'s Extensions

The Electric Steel & Forge Co., Cleveland, which recently took over the plant of the Crucible Steel Co., has completed plans for the large extensions to its plant, which will include the installation of electric furnaces and rolling mills for the manufacture of alloy and tool steel. New buildings to be erected include a rolling mill building of mill construction 60 x 600 ft., a machine shop 60 x 100 ft., and a storehouse 20 x 200 ft. One 6-ton and one 3-ton electric furnace will be installed. The furnaces will be located in the present melting building. The rolling mill equipment will include 16, 10 and 8-in. roughing and finishing merchant mill stands for rolling alloy and tool steel. These will be driven by variable speed motors. Two 6-ton steam hammers will be installed for breaking down the ingots and use in connection with a press which is a part of the present plant equipment. New equipment will also include 12 annealing furnaces of the car type, straightening machines, a pickling plant and chipping and grinding machines. Four electric traveling cranes will be required, one 15-ton and three 10-ton. Chemical and physical laboratories will also be provided. The company has just completed the installation of a heat-treating department that is equipped with two car type furnaces for heat treating Government forgings, and has added equipment to its machine shop. Contracts for the mill and other equipment will be placed shortly.

The C. & H. Drop Forge Co. has recently located in a plant at 145 Freylingheusen Avenue, Newark, N. J., having moved from Buffalo, N. Y., where the company was known as the McKaig Drop Forge Co. The business is now owned by the Clucker-Hixson Co., 256 Broadway, New York.

Forbids Time Studies and All Bonuses

House Overrides Its Committee on Military Affairs and in Fear of Union Labor Votes for Limitation of Output

WASHINGTON, June 11.—The House of Representatives in a vote that overrides the mature judgment of the Committee on Military Affairs has injected into the colossal \$12,500,000,000 army appropriation bill an amendment prohibiting time studies and premium payments in the manufacturing establishments of the Government. In forcing this amendment into the bill on the eve of its passage the opponents of scientific management in the House staged a characteristic exhibition. Debate on the measure was permitted to proceed until its consideration had been practically completed and both wings of the chamber were impatient for its speedy passage. Without previous notice, the amendment was then offered and on a division of the House was rejected by a narrow margin. The champions of organized labor then demanded a vote by tellers which would afford the labor lobby an opportunity of recording the names of those opposing the amendment and under the stress of this condition the House reversed itself and agreed to the amendment by the narrow majority of five votes. No attempt was made in the House to divide the question, as was done in the Senate on the naval appropriation bill when the prohibition regarding time studies was retained in that measure, while that against the payment of premiums and bonuses was stricken out. A vigorous effort will be made to eliminate the entire anti-scientific management rider from the bill in the Senate committee and a sharp contest both in committee and on the floor is therefore assured.

Navy and War Secretaries Divided

In summarizing the provisions of the army appropriation bill as completed by the House committee attention was called in this correspondence a fortnight ago to the significant fact that the anti-scientific management rider, which for several years has been added to this measure by Congress, was omitted and it was suggested that the labor leaders would doubtless seek to force the amendment into the bill on the floor. It has since developed that the House committee considered the rider, but in view of the enormous increase in the cost of production, which is known to have followed the abolition of time studies and premium payments in Government establishments, Chairman Dent and his colleagues were unwilling to assume the responsibility of adding so great a burden to the taxpayers of the country. In marked contrast to the action of the Secretary of the Navy, who recommended the adoption of the rider, the Secretary of War had opposed it strongly and the entire organization of the Ordnance Bureau had gathered overwhelming evidence concerning the losses that would accrue to the Government as the result of the proposed prohibition. The bill, therefore, was reported without the usual rider.

In the last hour of the consideration of the army bill in the House, Representative Lunn of New York offered the rider in the language in which it was adopted in the army appropriation act of last year. Mr. Lunn, who is a member of the Military Committee, declared that he was absent at the time the rider was stricken out of the bill, but that he was convinced that a majority of the committee now favored its retention. The elimination of the rider, he said, would certainly "arouse an unfortunate spirit that would not be aroused if the law was made to conform to the provisions heretofore adopted." The "splendid spirit of loyalty on the part of America's workers," he added, "should not be impugned by an inference that they need prodding by a stop-watch speeding-up-system." Mr. Lunn also expressed the

opinion that the Secretary of War had made no request for the striking out of the rider.

Secretary Baker Denies Speeding Up

Representative Black of Texas promptly challenged Mr. Lunn's statement concerning the attitude of the Secretary of War and read into the *Record* a letter addressed by that official to the Speaker of the House, in part as follows:

The wages paid to our operatives at the Watertown Arsenal as a flat rate, irrespective of their response to the time system, is the current rate of the community for similar work, and in addition to that premiums are offered, not large but large enough to stimulate continuous and faithful activity. So far as I know, there is not a case on record at Watertown since the introduction of this system of a nervous breakdown or physical exhaustion due to excessive work nor is it claimed that the operatives in that plant, protected as they are against long hours by a wise eight-hour provision, are in any sense driven or hurried beyond a fair and safe limit.

The legislation which is being urged upon Congress is advocated by organized labor, which is opposed to the system intended to be prohibited, for the essential reason which is embodied in the charge that it is a speeding-up system. I can not understand this charge as having any other meaning than that the work required of the employees by the system is unduly severe. Of the truth of this charge in the practice of the system at the Watertown Arsenal there is no evidence whatever, but there is a great deal of evidence the other way. There is no complaint of overwork at the arsenal and no workman has been discharged because of failure to meet the requirements of the system.

To prohibit the system, of which the record shows undoubted advantages both to the Government and to the employees, because of a charge unsupported by evidence or even by any attempted evidence, for there has been no effort to prove overwork at the Watertown Arsenal, seems to me to be most unwise.

Representative Keating of Colorado, who for several years has been one of the most extreme opponents of scientific management, admitted that the Secretary of War had written the letter read by Mr. Black, but insisted that he had more recently addressed a communication to the Governors of several of the States in the course of which he appealed to them to "maintain the existing safeguards as to the health and welfare of workers." This vague statement, obviously not intended to refer in any manner to the subject of scientific shop management in Federal manufacturing establishments, being the "last declaration" of the Secretary of War, Mr. Keating insisted should be the only one "to carry weight with the House."

Representative Lunn then sought to force Chairman Dent publicly to define his position with regard to the rider, and with apparent reluctance the chairman stated that he was prepared to withdraw his objection to the provision, saying:

It is true that this proposition was submitted to the Committee on Military Affairs. The committee has rejected it on several occasions, but uniformly it has been put in the bill on the floor of the House heretofore. I have forgotten how many times the proposition has been submitted on the floor of the House in connection with the army appropriation bill. I had hoped that it would not be injected into the bill at this time, but in view of the fact that it has been carried in the army appropriation bill for a number of years, and in view of the fact that this very House has put the same provision in the naval appropriation bill, and the matter is now pending, as I understand it, with some difference of opinion between the Senate and the House on that subject, I think in order to expedite matters that I will withdraw my reservation of a point of order and ask that the amendment be agreed to.

Representative Moore of Pennsylvania promptly renewed the point of order withdrawn by Chairman Dent. He said:

It seems to me that we ought to face an amendment like this and not run away from it. It is a serious matter to the Government. In times of war I do not believe we should hamper the President of the United States, especially with respect to the largest war appropriation bill ever passed by any parliamentary body. We appropriate about \$12,500,000,000 here. The money is given freely in taxes and loans from the people. Both sides of the House are united and harmonious in their desire to pass the bill in order to strengthen the work of the President in prosecuting the war. Yet just as we propose to put the finishing touches upon it we are asked to say, "Provided, Mr. President, you will operate the factories and the workshops just as we tell you to do."

Why, gentlemen, Samuel Gompers, the head of the American Federation of Labor, who may have his spokesmen here this afternoon, has indicated his desire to work with the President of the United States. He has preached it from the housetops, and so have the other labor leaders of the country. They have expressed their desire to work with the President.

Since the war began wages have gone up, just as the cost of living has gone up. Workmen have contributed generously of their labor to the common cause of prosecuting the war. But now comes the greatest war bill of them all, and strangely enough it comes on the very day that the Director General of Railroads has found it necessary to issue a public statement calling upon striking workmen over yonder in Alexandria to play fair with the Government. Mr. McAdoo, speaking for the Government and the President, has been obliged to say to those who would impede the war's progress that the cause of the Government must be supreme. Take up the morning paper and read the statement of Director General McAdoo. It is a call to workmen to be loyal to their flag. He tells the strikers that they are obstructing the war, and that the Government must rise superior to their personal wishes. Do we want to take issue with that proposition?

It is most untimely to come into this House when we are passing the greatest war bill of all the war bills and say to the President, as this amendment proposes to do: "Mr. Commander-in-Chief of the Army and Navy, you may have this \$12,500,000,000, but you must abide by the rules of the union in the various workshops or the war must stop."

Take the responsibility, those of you who desire to vote for this amendment at this particular time. With you I value and appreciate the services of labor, but for one I am not willing to tie the hands of the President in these war times by this hamstringing amendment.

Fear of Labor Unions Wins

The question being taken on the adoption of the rider, it was lost by a rising vote of 52 ayes and 53 noes. Immediately Representative Lunn demanded a vote by tellers in order that the champions of the rider might locate its opponents, a roll call in Committee of the Whole being prohibited by the House rules. As the members filed between the tellers to be counted numerous changes were noted and when the count was completed the announcement was made that the amendment had been agreed to by a vote of 63 to 58.

The Senate Military Committee will give early consideration to the army appropriation bill, and while it is believed a majority of its members are opposed to the prohibition of scientific management it is probable that the same influences that have already forced the rider into the naval bill will inject it into the army measure, which is the most stupendous budget bill ever framed in any country of the world.

Manufacturers' Methods Defended

During the general debate on the army bill in the House, a defense of the methods of American manufacturers of ordnance material was made by Representative Tilson of Connecticut, who has acquired a very comprehensive knowledge of the subject during his service in Congress. Commenting upon recent criticisms of the manufacturers engaged in producing machine guns, Mr. Tilson said the public was uninformed as to the character of the problems involved in putting a large manufacturing establishment on a quantity production basis:

For certain operations it is necessary to have a large number of tools, because one operation may be performed very rapidly and another operation, equally important and which must be done on each gun just the same as the other, can be done only very slowly. Therefore, in order to produce

the guns at a certain given rate you must have greater preparation for doing those operations that take a long time than for those operations which take only a short time.

It is just as if you had a flow of water through a pipe of a certain size, where the flow is very slow; the pipe will admit only so much water. If you wish to enlarge the stream and build part of the pipe ten times as big, but leave the diameter of the pipe elsewhere just the same as before, you leave it at the original capacity; you will get no larger flow than through the original small pipe.

The smallest pipe is sometimes called the "neck of the bottle." It is the slowest point of production. In order to enlarge the production it is necessary to produce more tools, jigs, dies, and other essentials of manufacture. It may then be found that at another point is the "neck of the bottle," and so on until it is found out exactly the number of machines, tools, and other appliances of all kinds necessary for an even flow and a maximum amount of production from each operation. That is what is called "the peak of production."

Status of the Browning Gun

Now, as to the Browning gun, neither the light nor the heavy gun has reached anything like the peak of production. Both of them are being put into production from the manufacturer's standpoint. The light Browning gun is much further advanced than the heavy Browning gun. Both are now being made by machinery; not full production yet, understand. It is necessary to tool up a great many departments and for many operations in order to have them come through rapidly. We are trying to find out where the "neck of the bottle" is, in regard to the manufacture of light and heavy Browning guns, and are enlarging it from day to day. We are hopeful that we are going to have by the end of the year a full maximum stream of production coming in. We are hopeful that we will be able even before the end of this year to equip some of the divisions in Europe with the light Browning, those that now have to be equipped with a foreign type of gun, which is a great disadvantage, because it does not shoot American ammunition.

To Limit Cost-Plus Contracts

The movement against the cost-plus system of making Government contracts was given an additional impetus by the House when it adopted an amendment to the army appropriation bill offered by Representative Anthony of Kansas, in the following terms:

Provided, That where practicable so to do, no work be done or contract made under or by authority of any provision in this act or under a percentage or cost-plus percentage basis, nor shall any contract, where circumstances so permit be let involving more than \$1,000 until at least three responsible competing contractors shall have been notified and considered in connection with such contract, and all contracts to be awarded to the lowest responsible bidder, the Government reserving the right to reject any and all bids.

In explanation of the qualification of the prohibition by the use of the phrases "where practicable so to do" and "where circumstances so permit," Representative Anthony said that he recognized that in construction work and in the award of contracts for military supplies there might be emergencies wherein it would be desirable to waive the soundest business methods and to adopt the cost-plus basis for contracts. By making the provision more or less flexible Congress could express its disapprobation of the cost-plus system without seriously embarrassing the War Department.

Representative Sherley of Kentucky, chairman of the House Committee on Appropriations, expressed his approval of the amendment with the qualifications contained therein. He denounced the cost-plus system as one that frequently resulted in "gross extravagance" and declared that such contracts should never be entered into except as a last resort. At the same time he did not think that a hard and fast prohibition could be adopted in this emergency without crippling the department.

W. L. C.

Shippers from nearly every industry of Kentucky were present at a meeting in Louisville last week between the Kentucky Railroad Commission and the state shippers, at which resolutions were adopted asking that any increase in freight rates be postponed until Oct. 1, in order to give the shippers a chance for a hearing. A strong telegram of protest was forwarded to Washington by a commission appointed by Laurence Finn of the commission.

By-Product Coke Industry in War Time*

Tremendous Importance of Fuel Conservation—
Furnishing Raw Materials for High Explosives a
Vital Matter—Keystone Products Described

—BY WILLIAM HUTTON BLAUVELT†—

For many years European economists have felt that it was a reproach to the United States that it should cling so long to the beehive oven for the manufacture of coke and deliberately throw away millions of dollars' worth annually of the many valuable by-products obtainable from the distillation of coal. Most fortunately for us in this great crisis through which we are now passing, this reproach is being rapidly removed. Forty per cent of the coke made in 1917, or 22,600,000 tons, was by-product coke, and some time this year, as the new plants come into run, the production of by-product coke will pass the beehive output. Ovens with a capacity of 13,500,000 tons of coke are in process of construction, and half as much more is contemplated. What did this great and rapidly growing



W. H. BLAUVELT

industry mean to us as we entered the war a year ago and began our preparations for taking our place as active combatants in this greatest of all struggles?

From the side of fuel conservation, which last winter's experience showed us to be of the most vital importance, the by-product ovens now in run have a capacity for producing 5,000,000 more tons of coke per annum than if the same coal had been coked in beehive ovens. Moreover, they have made possible the utilization for coking purposes of many deposits of coal that otherwise would not have been available.

Assuming all the plants were in full run, they would produce 315,000,000 gal. of tar, which may be used for fuel, having the same efficiency as fuel oil, to say nothing of its other important uses in the arts. Assuming an average production of 4000 ft. of surplus gas per ton of coal, including ovens of the older and newer types, the average annual production is 168,000,000 ft. of gas, which would melt 12,000,000 tons of steel in the open-hearth furnace.

Materials for Explosives

But it is in furnishing raw materials for high explosives that the by-product oven industry is most vitally essential to our prosecution of the war. Entirely aside from the economic importance of the conservation of our nation's resources, which is so vital at this time, if this industry had not been developed, we should have had to depend entirely upon the Allies for almost every pound of high explosives, without a plentiful supply of which, this highly scientific warfare could not have been carried on by us for a single day, and, as we know, the Allies have had to utilize every resource to obtain sufficient raw materials for producing their own explosives. Practically all the high explosive shells used at the battle front are loaded with picric acid, T.N.T. and ammonia powders. Picric acid is tri-nitro-phenol, which is produced by nitrating phenol or carboic acid. Carboic acid has been produced for many years from the distillation of coal tar, but under present conditions in this country very much the larger production of car-

bolic acid is obtained by the synthetic process by the sulphonation and nitration of benzol. T.N.T., or tri-nitro-toluol, is produced from the direct nitration of toluol, and the ammonia powders have, of course, ammonia as their base. With the exception of a relatively small production from gas works, all our supply of these products is obtained from the distillation of coal in the by-product oven. The ovens now in run have a capacity for carbonizing 42,000,000 tons of coal per year, and those building or planned will add 70 per cent to this amount. The present tonnage means an output of approximately 63,000,000 gal. of chemically pure benzol, 14,000,000 gal. of toluol and 100,000 tons of ammonia. I need only call your attention to these figures to demonstrate to you the importance of the by-product industry to our war requirements. It is not pleasing to contemplate what would have been our position if the large development of the by-product oven had been delayed only a few years.

Basis of Many Industries

This industry has done much more for America than the conservation of our fuel resources and furnishing a supply of raw materials for our high explosive shells. It has taken an important part in the development on a sound basis of a wide line of chemical industries, in which our country was so far behind others until quite recent years. American manufacturers have had the money and will and American chemists have had the brains and the knowledge, but until the products of coal distillation were available as raw materials, we made little progress in some of the great branches of chemical manufacturing, which had been so highly developed in European countries. The great color and dye industry is a notable illustration of this fact. While this industry itself is represented by relatively small values, some of the most important industries in the country are vitally dependent upon it. We learn from Government reports that there are over 14,000 establishments in our country which are absolutely dependent upon dyes and colors. These establishments employ over \$3,000,000,000 capital and it is estimated that over 2,000,000 working men and women are occupied in manufacturing plants which are directly dependent upon the use of artificial dyes and colors, and nearly all of these depend in whole or in part on the products of the distillation of coal for their raw materials. Naturally the color makers turn first to the colors which are consumed in the largest quantities, such as blacks and blues, but the list is being rapidly extended to cover the full line of dyes and colors used by the American trade. Printing inks, both black and colored, depend on the prussiates for their raw material, but it is doubtful whether it is realized in many of the thousands of printing offices in the country that the by-product oven is the basis of their supplies of ink.

Keystone Products

From the point of view of the chemical industries, many of the products of the distillation of coal are what are termed Keystone products. That is, while they are relatively unimportant in themselves, they are essential to other greater industries, and still others owe their development to the needs created by these Keystone industries. For example, aniline, which is made from benzol, and which is the base of a long list of colors, is also the raw material for indigo. In the production of indigo, it is necessary to have available a supply of the strongest sulphuric acid, which is entirely beyond the possibility of the old and well-known chamber process. The contact process for producing these strong sulphuric acids was developed to meet this

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need, utilizing oxygen obtained from the air for the oxidation of the sulphur gases. With this process was developed the fixation of atmospheric nitrogen and the oxidation of ammonia for the production of nitric acid, thereby obtaining independence of the Chilean supplies of sodium nitrate. All of these processes have demanded more and more from the manufacturing chemists, and we have learned the way to be entirely independent of outside sources of raw material in so many lines of manufacturing which are essential to the best national life. Manufacturing chemistry is peculiar in requiring ripe experience in detail by those in direct charge of operations, as well as scientific knowledge of the processes used by those in general control, and the above brief reference will suggest to you the great chain of industries vital to the independent commercial success of our nation, which have been and are being built up in this country now that the supply of "Keystone" products has been made available by the by-product oven. After so many years of neglect, the progress we have made in the development of these closely interwoven industries is both remarkable and gratifying.

Perfumes Are Essentials

I have not time to go into the sanitary and medical supplies needed in the medical departments of our armed forces, but salicylate of soda and magnesia, asperin and salvarsan are illustrations of what our medical forces owe to coal distillation products. Perfumes may seem rather aside from preparations for war, but they are practically essential in the manufacture of soaps, pastes, ointments and salves as well as for less important uses, and the base of very many of these perfumes is chlorinated toluol and benzaldehyde.

While very much of our attention is necessarily occupied in the actual conduct of the war and the production of the necessary supplies in a variety which we are only beginning to realize, we are also giving much thought to what is to come after the war. I have endeavored to suggest briefly the many lines of important industries that have grown directly or indirectly from the "Keystone" products of the distillation of coal, and others will occur to you. It is most satisfactory to note the courage and energy with which American manufacturers have entered these fields, and the sound commercial basis upon which many of these industries have been established. When the military requirements are over and these manufacturers have been adjusted on the basis of peace requirements, let us hope that our manufacturers, assisted by well-considered Government aid, may be able to reach an even broader development of these industries than we have discussed and produce all of these hitherto somewhat unfamiliar products necessary for our national life. We have always excelled in mechanical products, although we have often permitted other nations to benefit more largely than we from our inventions, and this great emergency has shown that we are equally capable in chemical manufacturing, once we are assured of the raw materials and are aroused to the importance of these lines of industry.

The Hydraulic Power Co., Niagara Falls, N. Y., has placed a contract with the I. P. Morris department of the William Cramp & Sons Ship & Engine Building Co., Philadelphia, for the construction of what is stated to be the largest hydraulic turbine ever built, which is to be installed by the hydraulic company in the extension of its station No. 3. The operating conditions for which the new turbine is designed are as follows: Heads, from 213 to 214 ft.; speed 150 r.p.m.; discharge 1500 cu. ft. per second; capacity 37,500 hp.

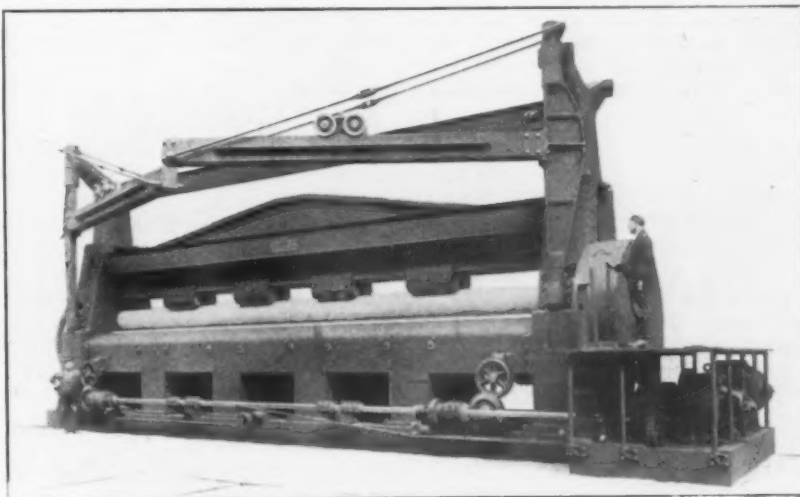
Horizontal 36-Ft. Plate Bending Rolls

A set of bending rolls which will handle 1-in. mild steel plates 36 ft. long and 1½-in. plates 30 ft. long was recently completed at the Niles Tool Works of the Niles-Bement-Pond Co., Hamilton, Ohio. The control of the machine is centralized at one end and four self-contained top braced jib cranes are provided.

The machine is of what is known as the strongback type and consists of two heavy cast-iron housings which are tied together by two heavy cast-iron side frames underneath and 20-in. I-beams at the top. These side frames have bearings for eight pairs of steel rollers, four on each side, to support the lower rolls, which are 16 in. in diameter and measure approximately 37 ft. in length between the journals.

The top roll, which is 19 in. in diameter, is reinforced by a heavy built-up steel girder which has four supporting roller bearings on its underside directly above those carried by the side frames. Steel elevating screws, located one at each end, are provided for raising and lowering the girder and the roll. The power for operating these screws is supplied by a 75-hp. electric motor and the mechanism is arranged so that it is possible to raise or lower both ends of the roll at once, or to raise or lower either end independently of the other.

The rolls are driven by a 100-hp. motor and the entire set of operating handles are grouped at a point adjacent to this motor. In this way, it is pointed out,



Mild Steel Plates 1 In. Thick and 36 Ft. Long or 1½ In. Thick and 30 Ft. Long Can Be Handled in a Recently Completed Set of Horizontal Bending Rolls Arranged So That Either One or Both Ends of the Top Roll Can Be Adjusted as May Be Desired

the motor controllers and the reversing and clutch levers can be operated from a single point on the operating platform, thus lightening the load of the operator.

The four top braced jib cranes which are provided for handling the plates have their posts at the four corners of the machine.

Improved Form of Elevating Industrial Truck

A recent addition to the line of industrial lift trucks built by the Cowan Truck Co., Holyoke, Mass., is provided with an improved locking device. This mechanism is designed principally to prevent the load from becoming unseated when the truck is being used on uneven floors. The new truck is built in several sizes for loads varying from 1000 to 3000 lb., and it is emphasized that even the maximum load can be readily raised by one man on account of the large ratio of the leverage in the elevating mechanism.

The Sullivan Machinery Co., Chicago, manufacturer of pneumatic tools and compressors, announces the establishment of a branch office at Washington at 210 Union Trust Building. Ralph T. Stone, associate of the New York office, will be in charge of its interests in Washington.

Alarming Fuel Situation Is Described

Administrator Garfield Appeals to the People to Help in Saving Coal—Conservation Program of Great Importance to Many Industries

WASHINGTON, June 11.—Fuel Administrator Garfield has worked out a detailed program for the conservation of fuel during the coming year which he denominates the "fuel budget for the season of 1918-19." It is based upon the assumption that the aggregated industries of the country will require about 80,000,000 tons more coal than was produced last year, that the increase in production will fall far short of this figure, and that, therefore, economies must be effected in the use of coal amounting to not less than 60,000,000 tons. These economies are to be brought about by a rigid inspection service comprehending the plants of all power users and public utilities, and such a measure of supervision of domestic consumers as may be found practicable; by centralization of power plants with a view to the abandonment of wasteful plants; by such devices as lightless nights, the curtailment of the illumination of public places wherever possible, and the utilization of so-called skip-stops in the operation of electric railroads; by voluntary agreements with non-war industries to curtail production, and by enforced curtailment where voluntary agreements cannot be obtained.

Will Work with War Industries Board

In curtailing the use of fuel by non-war industries the work of the Fuel Administration will be coordinated with that of the War Industries Board, the Food Administration, and other branches of the Government. For example, if the War Industries Board decides that a certain industry can receive but 25 per cent of its normal steel supply, the Fuel Administration will at once reduce the coal supply of that industry by 75 per cent. On the other hand, if the Fuel Administration decides that a certain industry can properly receive but 50 per cent of its normal supply of coal, Mr. Baruch will see that it receives but 50 per cent of its usual requirements of steel. In all cases the maximum figure will be followed; that is to say, the department making the heaviest cut will be followed by the other departments with the same percentage.

Dr. Garfield states that recent publications to the effect that the Fuel Administration contemplates giving out a list of non-essential industries to which no coal or less than a normal supply of coal will be furnished, is without foundation. The Fuel Administration does not recognize non-essential industries, taking the position that to follow such a rule as has been suggested would, in some cases, destroy entire communities. The administration does differentiate between war and non-war industries, but it has compiled no list, and it does not contemplate publishing such a category, appreciating fully that the results of such a publication would be most disastrous.

The following is Dr. Garfield's announcement concerning the fuel budget for the coming year:

Fuel Budget for the Season 1918-1919

"The fuel budget for the season 1918-19 has been completed by the United States Fuel Administration. We know the worst of a bad situation. A detailed survey of the coal required during the present coal year for war purposes, to keep our industries running, and for domestic consumers, foots up about 80,000,000 tons more than was produced last year. This is the figure on June 1.

"As our part in the great war increases we are confronted, from month to month, with unexpected additions to former estimates of fuel requirements and to greater demands on the man power of the country, so that those responsible for the conservation of fuel do not feel safe in assuming that the increasing demand

will be only 80,000,000 tons, nor in assuming that it will be possible to obtain from increased production more than one-half of the deficiency. Conservation must provide for unexpected contingencies, affecting both figures of production and of consumption.

"One has only to remember that the production of coal last season was 50,000,000 tons greater than ever before in the history of the country, and to reflect on the enormous added burden the war has put on our transportation system, as well as the man power which is necessary to produce and distribute coal, to understand that the fuel supply for this year is one of the most difficult and threatening problems the war has presented.

Estimated Requirements

"It is estimated that the industries not employed on war work will require something less than 100,000,000 tons of coal. All consumers of fuel, war industries and otherwise, must participate in the saving campaign, but the non-war industries are especially interested because whatever the deficiency turns out to be it will come out of their quota. Hence, the general prosperity of our industries, and the full employment of labor will depend upon saving, by economies and prevention of waste, between 50,000,000 and 60,000,000 tons of coal.

"In spite of intense efforts to increase the production of coal, the first five months of 1918 have produced only 10,000,000 tons in excess of the same period of 1917. If this is considered in relation to the immense physical task involved in producing 12,000,000 tons of coal per week, it is easy to draw the conclusion that this increased demand of 100,000,000 tons cannot, to any large extent, be met by increased production; and yet an actual deficit of half a million tons would mean a personal privation and an industrial disaster which no one can contemplate with equanimity.

Only One Answer

"What is the answer? There is only one—it is saving coal. It is the answer Europe has made in a similar situation. Saving coal in every possible way, and by all of the people. If we are to avert the privations and disaster attendant upon a shortage of coal much greater than last year, the most intensive measures of fuel economy must be carried into every activity of industrial and domestic life, and the co-operation of every man and woman in the country must be 100 per cent.

"The Fuel Administration has foreseen the situation represented by these figures, and through its conservation division has organized fuel-saving campaigns reaching out into every department of our national life where fuel is consumed. Every means of saving which ingenuity can devise and engineering knowledge organize will be employed and enforced. Every waste will be pointed out. Every possible improvement in heating, lighting, and power systems will be given nation-wide publicity. Every one will be asked to co-operate where necessary sacrifices must be made.

"Fuel economy is being given intensive study in connection with steam plants and industrial uses. An organization is already in existence, provided with engineers and inspectors, who will visit every one of the 250,000 steam-producing plants in the country, with a view to the improvement both of equipment and firing practice. This is expected to save at least 20,000,000 tons of coal. The economical use of power in factories will be in the hands of organized shop committees. The power loads of the public utilities throughout the country are being studied with a view to readjustments

which will result in enormous saving. In many cities the isolated plants, which use an extravagant amount of coal in proportion to the power produced, will be urged to obtain more economical power from large producing stations.

Unnecessary Expenditures

"The introduction of 'skip-stop' schedules on all the street railways is expected to save 1,000,000 tons of coal. The consolidation of ice plants will yield a still larger tonnage. Unnecessary outdoor lighting, including advertising signs and display illumination, will be reduced. Hotels, office buildings, apartment houses and public buildings are being asked to join in rigid economy of light and heat.

"Every American citizen will be asked to clean his furnace, keep it in repair, and study economical firing. Instructions prepared by the highest authority will be furnished by the Fuel Administration. If every one joins heartily in this movement, from the owner of an industrial plant to the householder with his furnace and cookstove, if indoor and outdoor lighting is reduced to the amount absolutely needed, if houses are not overheated, the furnace dampers properly adjusted, and the ashes sifted, it will be easily possible to save from 50,000,000 to 75,000,000 tons of coal without serious inconvenience to the American people.

"A saving of 60,000,000 tons of coal is the one possible avenue of escape from national disaster. Necessities of war must be supplied. The coal deficit must inevitably come out of the necessary fuel for non-war industries. These industries employ millions of our population, and furnish the backbone of our national wealth. Factories will shut down and men be out of work in proportion to the coal deficit. Every ton of coal saved will keep 50 workmen from idleness and permit an additional creation of several hundred dollars' worth of national wealth.

"The Fuel Administration has frankly given to the public the statistics of an alarming fuel situation. It desires to state just as frankly, and with all the emphasis possible, that it is in the power of the American people, through fuel economy, to save the country from the effects of the fuel famine."

Engineer Officers Wanted for U. S. Army

Two thousand additional engineer officers are immediately required for the United States Army. An examination will take place soon, and all who are professionally and otherwise qualified may obtain the necessary application blanks by written request from the Chief of Engineers, United States Army, Washington. If the application is accepted, the applicant will be notified of the visit of an examining board to his locality and of the time and place of his examination. The examining board will receive applications for appointment in the grades of first lieutenant and captain. Only those applicants meeting the following requirements will be considered:

Age limits: For the grade of first lieutenant, 32 to 36 years. For captain, 36 to 42. These limits may be slightly increased or decreased, in special cases, except that no one who is within the draft age will be considered.

Applicants must be engaged in the active practice of the engineering profession, in one of its various branches, and be in good physical condition.

Professional qualifications and experience: No set rules have been established. An applicant's fitness for commission will be determined by the examining board.

All applicants must be citizens of the United States.

No application will be received from anyone now in Government service.

Applications will not be considered from anyone born in a country with which the United States is at war, or born in a country allied with a country with which the United States is at war, even though he be a naturalized citizen of this country.

All applicants accepted by the examining board will be commissioned within 10 days or two weeks, and within a few days thereafter, will receive orders to report at an Engineer Officers' Training Camp, either at Camp Lee, Petersburg, Va., or at Camp Humphreys, Va., near Washington, where they will be given a course in military training previous to being assigned to duty with engineer troops.

WORKING WITH WORKERS

Plans for Making Government Employees Comfortable and Happy

At nearly all Government projects there are now under way provisions for recreation and social welfare. Community huts are being erected where men may meet and play their games, where they may smoke and talk. Moving pictures are being provided and are attracting increasingly great audiences and the most popular pictures are those of current events and not the more sensational kinds.

Reading rooms with books and magazines are being furnished for those studiously inclined. Baseball diamonds and tennis courts and up-to-date equipment are being built and baseball leagues organized.

Lectures and concerts are to be provided from time to time and bands are being organized and equipped.

Y. M. C. A. men are in charge in some of the large projects and ordnance welfare executives are being provided at others. Health conditions are being improved and at one project the U. S. Public Health Service is undertaking a clean-up resembling that so efficiently inaugurated at Panama.

Another interesting phase of work which is being undertaken by the Ordnance Department through the Community Organization Branch of its Industrial Service Section is to work hand in hand with groups of citizens in those cities containing factories producing munitions, to eliminate those community conditions which may be adversely affecting the welfare of labor.

Many of these cities are congested by war workers beyond their power to furnish community facilities for the newcomers. Part of the program to be worked out in such cities by the Community Organization Branch is as follows:

Campaign of patriotic education to impress upon workers that they are the second line of defense and their efforts absolutely essential to the safety of the men in France and the winning of the war.

Formation of housing companies and of building and loan associations and the encouragement of home-building by individuals.

Extension of trolley tracks to new districts and increased service.

Extension of water, sewer, gas and electric service to the new housing districts.

Ordinances to prevent the exploitation of the workers.

Encouragement of growing of produce by nearby farmers and installation of public markets by producer and consumer.

Provision of facilities for plowing and harrowing home gardens.

Installation of branch libraries for convenient use of new workers and their families.

Erection of community center huts with moving pictures, supervised dances, concerts, lectures, etc.

Increased school facilities for children of new workers and night school during winter months for adults.

Control of alcohol and social evils and education of workers by medical specialists.

Complete Americanization movement for naturalization of aliens and instruction in history and citizenship.

Education of workers, their families and especially the children to the need for thrift, and the complete utilization of the workers' time.

It is confidently believed that all this, properly worked out, will have a direct influence upon the stability of labor and the production of munitions, and consequently upon the winning of the war.

The General Motors Corporation, Detroit, has acquired a site of 105 acres in the northwestern part of St. Louis on which it will equip an assembling plant and factory for automobile bodies. The factory buildings to be constructed on the site will cover about 40 acres, and will cost several millions of dollars.

The Carpenter Steel Co., Reading, Pa., is erecting a new power house across the Schuylkill River from its plant. It will be 60 x 120 ft., with a boiler capacity of 2400 hp., and is designed to replace existing power-plant facilities.

Geared-Head Lathe of Massive Design

David A. Wright, 568 Washington Boulevard, Chicago, is manufacturing a type of the Fifield lathe with geared head with beds of any desired length, and 34 to 96-in. swing. They are of massive design, with large wearing surfaces, and all main and high-speed bearings bushed with bronze and securely fastened to seats having oil channels with oil cups located convenient to the operator. Pinions, shafts, feed screws and bolts are of steel, the spindle centers being of hardened and ground tool steel fitted for easy extraction.

The bed has V-tracks to which the carriage is fitted. The headstock, tailstock and steady rest are fitted on the inside. The bed is of heavy, deep box section, with heavy cross ties and double ribs longitudinally between the walls. Through the center is a cast rack for tailstock brace pawl. The headstock is of the all-gear type with three mechanical changes made by suitable lever.

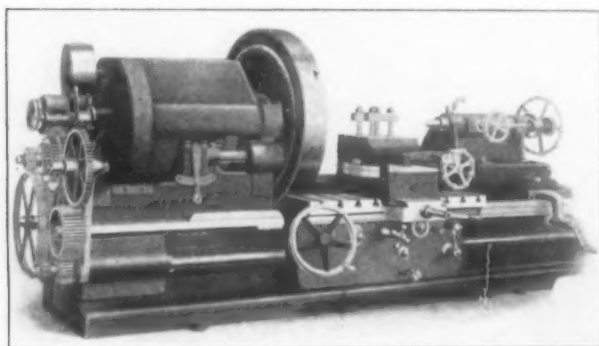
The faceplate is of cast iron, and of heavy section with T-slots. It is either pressed on the main spindle, or the latter is threaded and if desired steel faceplate jaws are provided. The faceplate driving gears are accurately shouldered and cut internally.

The carriage is gibbed underneath the race, both front and back, and fitted with clamps for securing it in position for cross feeding. At either end are wipers to keep the bearing surface clean. There is power and hand lateral feed in either direction. The tool slide has a large bearing with taper gibs for taking up wear and is fitted with straps and bolts for holding large cutting tools. A taper attachment can be secured to the carriage by bolting in the T-slots at the side of the bed.

The apron is equipped with a friction clutch for transverse feeding and a lead-screw nut for threading, with a feed reverse in the apron. The feed gears are driven by a spline in the lead screw. The threads of the latter are used only for thread cutting, and the screw is of sufficient length to allow the carriage to travel the full length of the bed. Change gears are furnished for cutting threads. They are 14 in number and operate on a cone bearing through the lever changing mechanism.

The steady rest, furnished with the lathe, is of box section, with three large jaws and large wearing surfaces. The top half is swiveled on one side.

The tailstock is of heavy box section, with long wide bearings fitted to the bed, and ample bolts and clamps are provided for securing it to the bed. A tail brace pawl engages in the cast rack in the center of



An All-Geared Headstock Lathe of Massive Construction Which Can Be Furnished in Any Desired Length of Bed with Swings Ranging from 34 to 96 In.

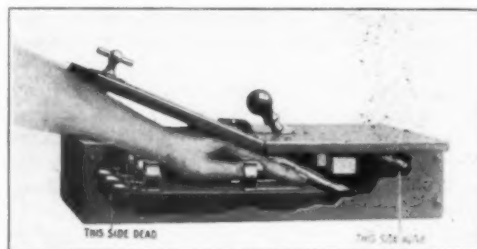
the bed, as a precaution against its shifting under a heavy load. The tailstock is operated by a crank wrench, with gearing engaging the steel feed rack. The spindle is actuated by a large handwheel through gearing, and clamped by a power clamping lever.

The Sun Shipbuilding Co. may build a 1000-room hotel at Chester, Pa., for the housing of workmen who will be needed for the contemplated expansion of the company's shipbuilding activities.

A Switch with No Exposed Live Parts

For use as a substitute for the ordinary knife switch, the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is marketing a so-called safety switch in which no live parts are exposed or accessible in ordinary operation or when fuses are being replaced. The current carrying parts of the switch and fuses are inclosed in a steel box, and the circuit is opened and closed by a toggle type operating mechanism. The cover of the box containing the switch is in two parts. One section is screwed in place to form a permanent covering for the switch, while the other part is hinged to swing back and permit the renewal of the fuses which are located in the other portion of the box. To guard against accidental contact with live parts, a latching mechanism is provided which is relied upon to make it impossible to open the cover without first opening the circuit and rendering all fuses and other accessible parts dead. In this way, the fuses may be replaced at any time without danger, since as long as the door of the case is open, the switch cannot be closed.

If desired, the switch handle can be fastened in the off position with a padlock, thus making it impos-



A Special Locking Mechanism Prevents the Opening of the Cover of a New Safety Switch to Replace Fuses Without First Opening the Circuit.

sible for the switch to be closed except by the person having the key, while by using a second padlock the cover may be closed to prevent tampering with the fuses.

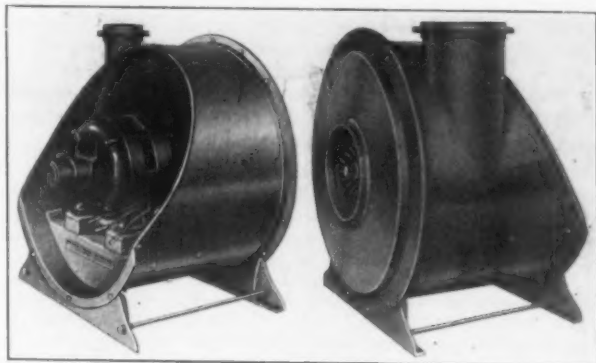
Accident Prevention Records at the Ford Plant

What are believed to be two records in the prevention of industrial accidents have recently been established at the plant of the Ford Motor Co., Detroit. These are a reduction of 74.2 per cent in the number of lost-time accidents in 18 months, and the occurrence of only one fatal accident in 11 months. In April of this year only 46 lost-time accidents were recorded for the 26 working days, or 1.4 accidents per 1000 employees. If the time lost in these accidents was distributed over the entire working force it would amount to but 7.3 min. for each employee. These two records are all the more noteworthy if the fact is taken into consideration that they were made under war-time conditions when it was necessary to hire new men to replace those that enlisted or were drafted for service.

A trade acceptance meeting will be held at the La Salle Hotel, Chicago, June 17, the day immediately preceding the opening of the annual convention of the National Association of Credit Men. The meeting will be held under the auspices of the American Trade Acceptance Council made up of representatives of the Chamber of Commerce of the United States, the American Bankers Association, the National Association of Credit Men and the National Association of Manufacturers. Lewis E. Pierson, chairman board of directors Irving National Bank, New York, is chairman. The representatives of the National Association of Manufacturers are W. M. Nones, president Norma Co. of America, New York; E. F. DuBrul, president Miller, DuBrul & Peters Mfg. Co., Cincinnati; Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia.

Slow-Speed Foundry Turbo-Compressor

For supplying air at pressures of 1 and 1½ lb., the Spencer Turbine Cleaner Co., Hartford, Conn., has developed a slow-speed turbo-compressor. It is designed to furnish the air required for oil and gas-burning fur-



Air at Low Pressure for Oil and Gas Burning Furnaces, Foundry Cupolas and Pneumatic Tubes and Conveying Systems Is Supplied by a New Turbo-Blower in Which the Driving Motor and the Turbo-Compressor Are a Single Unit.

naces, foundry cupolas and in connection with pneumatic tube and conveying apparatus, etc. The driving motor and the turbo-compressor form a single compact unit in which gears and belts are eliminated. Another feature about the design of the compressor is the wide clearances provided between all stationary and moving elements.

The construction is of the double-wall type of plate steel, which, it is pointed out, gives great strength in combination with light weight, and as the motor and compressor form a single unit, no special foundation is required. There are only three bearings in the compressor, two for the motor and a ball thrust bearing. The driving motor is a standard type 60-cycle alternating-current or direct-current unit of any standard voltage operating at a speed of 1750 r.p.m.

The pressure is practically constant from no load to full load with a minimum variation throughout the entire range of volumes, so that pressure will not run up when the volume of air in use is reduced, and with the full volume suddenly required the pressure will not fall. A high efficiency is claimed for all services, including their partial load for a considerable length of time.

As regularly built, the pressure outlet is the vertical position shown with the opening at the top, but the compressor can be furnished with the outlet at the bottom and discharging downward, or with the outlet at the upper right or lower left corner as viewed from the motor end. In all, 24 different sizes of compressor are built, 12 for furnishing from 600 to 10,000 cu. ft. per min. at a pressure of 1 lb., and the same number for furnishing from 450 to 6750 cu. ft. per min. at a pressure of 1½ lb.

A New Holder for Boring Mill and Lathe Tools

A new tool holder has been placed on the market by the Ready Tool Co., Bridgeport, Conn. Like the other holders built by this company, the latest one is designed to fit existing toolpost equipment and uses an inserted piece of high-speed steel stock to do the cutting. This holder, which is case hardened inside and out, has been developed for use on boring mills and vertical turret lathes, and can be used either right or left hand. The cutter is supported and backed up against the feed of the cut, an arrangement which is relied upon to give the rigidity required in machines of this type. The cutting member is held in place by low set screws, thus to avoid projecting screw heads.

A number of creditors of the Cayuga Tool Steel Co., Auburn, N. Y., have commenced Federal court proceedings to compel a receivers' sale of the property. George Timmins and George C. Pearson, receivers for the company, have been asked to show cause why such sale of property should not be made.

Plate Shearing and Punching Machine

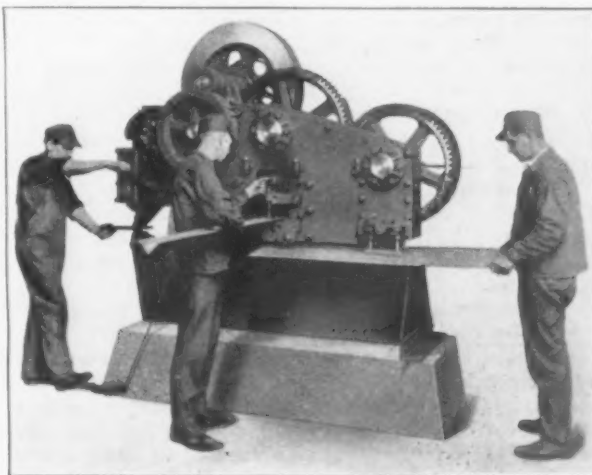
A universal plate shearing and punching and bar cutting machine with a steel plate frame has been brought out by the Buffalo Forge Co., Buffalo. In addition to combining a plate shearing mechanism of the slitting type in a punching and cutting machine, emphasis is laid upon the fact that three distinct operations can be performed without interfering with each other and the knives required are capable of either independent or simultaneous engagement. Another feature about the machine is the use of a supplementary gag operated by a handle for bringing the punch down on the work when it is desired to locate center marks or set up dies and punches. In addition to cutting angles and tees, it is possible by substituting special knives to cut various rolled steel sections.

The frame of the machine is built of steel plate which it is pointed out reduces the weight as well as giving a more compact unit. The machine is intended for driving either by a belt or a 7½-hp. motor, and machine cut gears and pinions are used for transmitting the power to the various knives. These are controlled either by a treadle or a hand lever, and in designing the machine an effort has been made to simplify the operation and eliminate the use of the hammer and wrench for making adjustments that are required in daily service.

The machine will shear plates ⅝ in. thick and it is possible to slit plates of any of the ordinary widths or lengths. The knives which are 8 in. long are engaged by a jaw clutch and can be operated at the rate of 25 strokes per min. Two spiral gears operating through a crank and pinion provide for the adjustment of the stripper to free the work from the shear blades.

The capacity of the punching mechanism is holes 1 in. in diameter in a ⅝-in. plate, the travel of the punch being 1 in., and the number of strokes 25 per min. In addition to the hand or foot operated gag, another is provided for bringing the punch down on the work without penetrating the material to locate center marks and for use in setting up dies and punches. This gag is operated by a handle instead of the customary handwheel.

Either square or mitre cuts can be made in angles and tees with the ordinary equipment, while by substituting special knives it is possible to cut 6-in. beams and channels and other rolled sections at the rate of 25 strokes per min. In connection with the bar cutting mechanism, adjustable stops are provided to en-



Plates Can Be Slit and Shapes Cut or Punched in a New Universal Machine with a Steel Plate Frame. It Being Possible to Perform All Three Operations Simultaneously.

able mitres to be cut in angles up to a maximum of 2½ x 2½ x 5 16 in. If square cuts are to be taken, angles up to 4 x 4 x ½ in. can be handled.

The Roberts Pipe & Scrap Iron Co. has been incorporated at Muncie, Ind., with \$25,000 capital stock, to deal in scrap iron. The directors are George D. Roberts, Isaac Plost and Benjamin Azimer.

Meeting of Mechanical Engineers Last Week

Fuel Conservation and Vocational Training for the War Among the Important Topics—Anti-Efficiency Riders to Appropriation Bills Condemned

THE American Society of Mechanical Engineers held a meeting of unusual importance at Worcester last week. One of the most important topics which was taken up was one devoted to fuel. Under the auspices of the fuel conservation committee of the Engineering Council, a flood of contributions was collected covering facts as distinguished from opinions on the utilization of fuel under some twelve different heads. So overwhelming was the number of those who had offered information that the one session set apart for this subject was inadequate, and a second session was held and then only seven of the heads were taken up. Moreover, none of the contributions sent in in advance, for reading in the absence of the authors, was presented to the meeting, owing to lack of time. Out of this meeting the engineering and industrial world may count on the early publication of the information in the pages of the *Journal* of the society, or possibly as a separate publication. A review of some of the information discussed in the session is to be found elsewhere in this issue.

An important session was also held on vocational training. How the Gorham Mfg. Co. converted its factory for munitions manufacture was a feature of one of the New England sessions provided, and a scholarly study arguing for a permanent place in a democracy to be held by the small industry was presented by Prof. George H. Haynes of the Worcester Polytechnic Institute. The leading features of this paper have been prepared for presentation in these columns as space allows.

Reports were submitted by the committees on screw thread tolerances; on steel roller chains, and on weights and measures, the last presenting a large collection of facts bearing on the proposed metric system legislation and indicating that the metric system is far from being generally accepted in so-called metric countries, particularly in the light of the experience of those conducting an export business.

A session was devoted to safety education and safety matters; in one of the general sessions a paper was read on "A Foundry Cost and Accounting System" by Prof. William W. Bird, Worcester Polytechnic Institute; in another general session the papers included one on the "Efficiency of Gear Drives" by Prof. C. M. Allen, Worcester Polytechnic Institute, and F. W. Roys; on "A Self-Adjusting Spring Thrust Bearing" by H. G. Reist, General Electric Co., Schenectady, N. Y.; on the "Elastic Indentation of Steel Balls Under Pressure" by C. A. Briggs, Bureau of Standards, Washington, and "Stresses in Machines When Starting or Stopping" by F. Hymans, engineer, Otis Elevator Co., New York.

Employment methods as followed by the Norton companies described in an address by E. H. Fish of the Norton Co., and a paper on "Vestibule Schools" by J. C. Spence, Norton Grinding Co., were features of a session in the afternoon of June 6, following a luncheon at the Norton companies' administration building. Reviews of these papers will be presented as space allows. There were papers also on other activities of the Norton companies, including the Indian Hill housing development and the Norton hospital service, which have been discussed in these columns at different times.

Action on Anti-Efficiency Riders

An unusual step was taken by the meeting in passing a resolution condemning, not as manufacturers but as engineers, the riders affixed to Congressional appropriation bills prohibiting time and other studies of shop performance and the payment of bonuses or premiums.

It was presented by Prof. A. M. Greene, Jr., Rensselaer Polytechnic Institute and, addressed to the President of the United States, was in part as follows:

WHEREAS, it is the opinion of this society that accuracy and speed of production are important factors for the successful prosecution of the war, and, as engineers, we believe that time studies and bonus systems will aid in the increase of production and accuracy; be it

RESOLVED, that the membership of this society present at its semi-annual meeting held in Worcester, Mass., June 5, 1918, approve of the resolutions of the Engineering Council and respectfully request the President of the United States and both houses of Congress to give careful consideration to the disastrous effect of these riders on the proper amount of production of material for our men at the front.

Making Shell Casings by a New Principle

In one of the New England sessions, so called, George I. Rockwood, president Rockwood Sprinkler Co., Worcester, Mass., by means of blackboard sketches told of a new principle in power press operation in the manufacture of booster casings used by his company. It had been previously considered, he said, that the taper on these Schneider shell booster casings could not be drawn. The casing is thick at the open top and thin at the rounded bottom and has a taper on the outside. The army first decided to use bar stock and make these on screw machines and also not to make the taper. The French draw a thick cup and turn the outside down to secure the taper. The ingenious method evolved by his company consists of first making five drawings with the punches a little smaller than the die which in itself gives a taper desired but leaves five bunches on the outside of the casings. These five bunches are brought to a uniform taper by the use of a reversed taper punch, which as it enters the casing removes the five bunches, leaving a uniform taper but reversed. The withdrawal of this punch again reverses the taper, leaving the casing in the desired form. Mr. Rockwood also said that beside the customary use of tallow, the addition of talcum powder lengthened the life of the dies several hundred per cent. He stated that his company's share of a Government order of 40,000,000 casings was 8,000,000 and not another manufacturer has drawn these casings to taper.

Vocational Training for the War

One of the unusually interesting sessions of the convention was that on vocational training, held Thursday morning and presided over by Dean Charles H. Benjamin, Purdue University. The first speaker was Major James E. Cassidy, Camp Devens. He took as his main theme the thought that is now becoming widely recognized that the war has become a race between engineering abilities. He said that *materiel*, the comprehensive French word for which we have no good equivalent, was the determining factor. The side producing the greatest destruction of material will win. In this war territory means practically nothing. Destruction of material is the prime factor in the destruction of men; destruction of men is the prime factor in the destruction of morale. One statement that he made which attracted interest was that the Government had 2500 tanks now under contract.

He described briefly the work of the 23d Engineer Regiment, which is composed of 66 250-man companies, in all 18,000 men. This regiment is doing the road work in France and shortly these 18,000 men will be directing the work of 80,000 German prisoners.

Arthur L. Williston, principal Wentworth Institute, Boston, and educational director for New England of the committee on education and special training of the War Department, gave an outline of the extraordinary

problem presented in getting men to do a particular job at the right time in the right way. He emphasized how the lack of ships makes imperative the need of giving all possible training to men on this side so that time may not be wasted when they finally get to France. We need not engineers alone, he pointed out, but also a large supply of technicians and specialized workers of many kinds. He said that the committee had contracted for the teaching of 99,600 specialists now in the schools of this country, and there was hope of further contracts for the teaching of 40,000 more.

A warm reception awaited Lieut. André Morize of the French mission, who gave in an intense and authoritative way the story of the need of technicians in the warfare as now conducted. War, he said, is now a war of specialists. Men are largely useless unless highly trained. It is a war of fortified positions. Even the recent territorial gains of the Germans did not alter the truth of this statement, because they were eventually stopped by the fortification of new positions, and the character of the warfare resumed quickly its former standards.

One of the great needs was the training of men in the use of the new weapons, both in attack and defence. The old weapons are still useful but not to reach the men in deep trenches and dugouts. Men must now be trained for gas, flame, trench mortar, tanks and all the other new methods that have come in. The specialists thus called for must get technical training. Even a second lieutenant of infantry must know much about the telephone, telegraph, drainage and many other matters. He said that too much emphasis cannot be placed upon the statement that the war will not be won by men with guns and bayonets but by all of the country organized for the special purpose.

An interesting feature not on the regular program was the showing of a motion picture of the demolition of a large brick stack. John R. Freeman, Providence, R. I., in describing this operation said that the bricks were practically cleaned in four hours after the job was started. When the picture appeared on the screen it was quickly seen that this statement had its humorous aspect as the bricks virtually cleaned themselves in the tremendous impact with the ground. Mr. Freeman also spoke of the very great shortage of toolmakers in this country and the effect it was having upon some of the vital industries. He said that a movement would undoubtedly be initiated to turn jewelry and watch makers into toolmakers.

The concluding feature of this session was the presentation of motion pictures prepared for the instruction of soldiers by the training committee of the general staff, U. S. A. These were to have been described by Major Frank B. Gilbreth, who was not able to be present, and in his absence Mrs. Gilbreth described briefly and entertainingly the work that the training committee was doing. The pictures showed how simply and how quickly the heavy type of Browning machine gun could be taken apart and assembled. The pictures are arranged to be used as instruction material in the camps, cantonments and officers' schools.

General Features of the Meeting

Besides its technical importance, the meeting was the largest spring meeting the society has yet held, the attendance approaching 1000, of which nearly one-half were members. The meeting will long be remembered for the unusual social diversions. At the opening session on Tuesday evening, June 4, a greeting was extended by R. Sanford Riley, president Sanford Riley Stoker Co., Worcester, making his presentation as president of the Worcester Chamber of Commerce, and an interesting address on the growth of Worcester was made by Charles G. Washburn.

Little Further Navy Buying in the East

At a war session held on Wednesday evening Paymaster C. E. Parsons, representing the U. S. Navy, told how a mailing list was maintained and being developed of suppliers to the Navy, but the names of brokers are eliminated whenever found. He regarded it an honor for a manufacturer to be on the list, and

any manufacturer who asks and has a legitimate reason will be placed on this mailing list to get information regarding work in contemplation. About 1400 specifications have been drawn up by the technical bureaus of the Navy and about every quarter a bulletin of specifications is issued. While the contract blanks themselves are very voluminous, he emphasized that there is nothing in them that any fair-minded contractor should object to. In May the average time of payment after an article has been received was seven days.

It is almost impossible to place any more business east of the Alleghenies, by reason of fuel shortage and railroad transportation difficulties, so that the Navy must in the future go to the West and South. The best that can be said of conditions in the East is that production will be kept up.

The entertainment features included a reception at the Worcester Art Museum, an evening at the Worcester Country Club and an all-day automobile trip on Friday, June 7, to Camp Devens, Ayer, Mass., taking in also Concord and Lexington.

George I. Rockwood, president Rockwood Sprinkler Co., Worcester, was chairman of the executive committee for the Worcester meeting. Paul B. Morgan, Morgan Construction Co., was vice-chairman. Prof. William W. Bird, Worcester Polytechnic Institute, was chairman of the finance committee; John W. Higgins, president Worcester Pressed Steel Co., was chairman of the reception committee; George N. Jeppson, works manager Norton Co., was chairman of the entertainment committee; Howard W. Dunbar, assistant chief engineer Norton Grinding Co., was chairman of the committee on printing and publicity, and Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Co., Worcester, was chairman of the committee of the Worcester Chamber of Commerce.

Next Spring Meeting in Detroit

The next spring meeting of the society will be held in Detroit. It may be added that the present membership is over 9200; that there are 1003 members in the United States service; that there are 22 local sections, including one State section; one affiliated society, and over 100 committees.

Steel Corporation Orders Again Decline

Unfilled orders on the books of the United States Steel Corporation on May 31 were 8,337,623 tons, a decrease of 404,259 tons from those reported for April 30. This is again the largest decrease in several months, that for April having been 314,524 tons. On May 31, 1917, the unfilled orders were 11,886,591 tons, next to the largest in the corporation's history. The following table gives the unfilled tonnage at the close of each month since January, 1915:

	1918	1917	1916	1915
January	9,477,853	11,474,054	7,922,767	4,248,571
February	9,288,453	11,576,697	8,568,966	4,345,371
March	9,056,404	11,711,644	9,331,001	4,255,749
April	8,741,882	12,183,083	9,829,551	4,162,244
May	8,337,623	11,886,591	9,937,798	4,264,598
June		11,383,287	9,640,458	4,678,196
July		10,844,164	9,593,592	4,928,540
August		10,407,049	9,660,357	4,908,445
September		9,833,477	9,522,584	5,317,618
October		9,009,675	10,015,260	6,165,452
November		8,897,106	11,058,542	7,189,489
December		9,381,718	11,547,286	7,806,220

Boiler Manufacturers Convention

The American Boiler Manufacturers' Association will hold its thirtieth annual convention at the Bellevue-Stratford Hotel, Philadelphia, Monday and Tuesday, June 17 and 18. Among the speakers on the program are: William H. Barr, president National Founders' Association; Edwin F. Sweet, assistant secretary of Chamber of Commerce of the United States; M. W. Alexander, managing director National Industrial Conference Board; Dr. D. S. Jacobus, Babcock & Wilcox Co. Charles M. Schwab, director-general of the Emergency Fleet Corporation, has been invited to speak. It is expected also that a representative of the American Iron and Steel Institute will address the convention.

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The New Distribution of Steel

Another and very important instance of the smoothness and efficiency of the co-operation between the Government and the iron and steel industry is furnished by the regulations promulgated by the War Industries Board under its resolution adopted June 6. The character of the steel to be made and its ultimate destination are both prescribed in as great detail as is necessary, and yet the operation of the actual machinery of production is left largely in the hands of the manufacturers. All matters of profits involved in the filling of individual orders, as compared with other orders, and all matters of taking care of favorite customers have been forgotten by the iron and steel industry long ago, and the War Industries Board shows its confidence in the industry by leaving the detailed conduct of its affairs largely in its own hands.

Under the new regulations there is established a "schedule of purposes entitled to preference treatment as determined by the priorities board," and the producers of pig iron or steel products are expected to distribute their material for these purposes, after having taken care of the material that is the subject of priorities certificates.

This schedule is not a schedule of "essential industries" or "more essential industries," but is distinctly one of purposes. The material, in other words, is to be scrutinized as to its final destination. No machine shop, metal working shop or fabricating establishment is left out by reason of the character of finished or partly finished product it has hitherto turned out. Judgment is to be according to the purpose involved in the individual lot of material desired from the blast furnace or the steel mill. If the purpose previously served is one that is not recognized in the schedule, it is up to the shop or the factory to adopt a different purpose, and for the ultimate customer, deprived of the product, to save the money and lend it to the Government or give it to the Red Cross or some other suitable organization.

There is no doubt that the blast furnaces and steel mills will take full cognizance of the fact that the regulations precisely refer to "their customers." Some friction has resulted, for months past, in discussions between a would-be buyer and a producer as to whether or not the buyer was really a recognized customer of the producer. During this

period of extreme scarcity of material the producers have naturally been disposed to give preference strictly to their regular customers. Now the practice is made practically mandatory, in that the producer must assure himself absolutely of the purpose to which the desired material is destined, and that he can determine much more certainly in the case of his regular customers than in the case of chance buyers.

Even a glance at the "schedule of purposes" discloses the fact that many items of consumption are included in the schedule which as a matter of fact have long been the subject of special treatment, particularly by the issuance of priority certificates. These uses, of course, are not deprived of their special preference by their being mentioned directly or indirectly in the schedule of purposes. There is an extra measure of regulation thus involved. The War Industries Board may, conceivably, restrict the issuance of priority certificates in some instances, while on the other hand if there is an uncertainty on the part of a producer whether a proffered order should be accepted as comprehended by the schedule of purposes, the prospective buyer may have recourse to the War Industries Board.

Time will show how much possible consumption of pig iron and steel products is left out, to be served merely as "all other" and presumably not to be served at all, at least for a few months to come. The amount of tonnage that the "all other" classes would purchase at this time is vastly less than it would have been one year ago, or even six months ago. The difficulty of doing business, the high costs, the scarcity of labor, and various patriotic considerations have all operated to reduce very greatly the tonnage importance of the items that are denied any preference.

A War-Winning Fuel Meeting

Necessity has brought about in recent months an intensive study of power plant economies. Industry has been struggling not merely with uncertainties of coal supply but with coal of inferior quality containing inordinate amounts of combustible matter. The result has been the collection out of this experience of a considerable body of facts on the fuel question, and through the meeting last week of the American Society of Mechanical Engineers observations were brought

together that are calculated to be of permanent as well as of temporary value.

Engineers have long appreciated the opportunities for betterment of power plant performance, but it has not been easy to get the approval of the financial executives to put through desired changes. When, as has often been the case, expenditures looking to improvement were shown justifiable, the heads of business have had other problems than striving for a reduction of 15 per cent in the cost of an item which in itself may be only 4 or 5 per cent of the cost of the finished product. The important cases of power economies overlooked are legion, but when, as explained by Dr. Hollis, past-president of the society, a 40 per cent power saving was effected recently in a factory, and all of it beyond the boiler room, the fact is not necessarily an indictment of the engineer.

It is naturally a source of satisfaction to power plant engineers that at last their specialty is forced by circumstances to receive adequate attention. Not only are we likely through Government intervention to have a wider acceptance of fuel as a chemical product giving definite results on combustion, and not merely a substance to be marketed by weight, but through the present need of conservation we are likely to have the chemical reactions in the furnace controlled to secure a maximum of efficiency and capacity in heat development. The publication of the upward of 50 contributions which were made to this subject at the meeting of engineers ought to go a long way toward supporting the Fuel Administration in improving the utilization of fuel and thus serve as an important war-winning tool.

The Reading of the Trade Paper

In his admirable paper on the trade journal read at the New York meeting of the American Iron and Steel Institute, Mr. Stephenson said: "So far as most of us are concerned, it is hardly accurate to speak of the trade-journal-reading habit, but rather of the trade-journal-skimming habit. And yet our trade and technical papers, to quote Mr. Hurley, are the best in the world. They are tools of the industry and they are made to be used." Mr. Stephenson described the hurried way in which the average reader scans the paper. He then urged the more careful reading of trade papers, said some people read thoroughly and gave excellent reasons for his belief that such reading would be highly profitable for all.

Webster says that to skim is "to read or examine superficially and rapidly in order to cull the principal facts or thoughts," and we may freely grant that that is the kind of reading of trade journals done by many subscribers; but the number of careful readers described by Mr. Stephenson is probably larger than he realizes and in spite of countless distractions is growing larger because the trade journal is constantly made more valuable and the quality of its service is more widely appreciated. So far as THE IRON AGE is concerned not a week passes but its editors are made aware of the fact that remarkably close reading has been done. Let an erroneous statement creep in, and

the fact that it has been read is made known with astonishing promptness. Granting, however, all that can be said about the superficial reading of trade papers, we venture the statement that such journals are read much more carefully than is the daily newspaper and by many much more faithfully than books or popular magazines; in fact, we seriously doubt whether there is anything printed which is less neglected by its subscribers than is the high-grade trade journal.

Skimming is characteristic of the age. It is almost a necessity of our complex life. Herndon, Lincoln's law partner and biographer, says he never knew a man who read so few books and knew the few so well as did Lincoln; but in his later years he doubtless did some skimming and would do more if he were living to-day, for the man who refuses to read a book or paper unless he can read every line will miss a great deal that he ought to know. Fundamentally, it is not a question of skimming, but of being selective in one's reading. As people are living more intensely than ever in the world's history and are asking more insistently, "Is it worth while?" they are coming to read with closer discrimination the things that count—not the sensational, the exaggerated, but the things of real significance, the things which are helpful in life, whether in solving problems of commerce and factory or questions relating to the progress of men or of nations.

Among other changes which the war will bring will be cleaner, better business. Men cannot serve in the great cause without losing some of the littleness of the past. And in the new day that is coming, the periodical, whether it be trade paper, newspaper or magazine, which has established itself on a solid rock by maintaining high ideals need not fear even severer tests than those to which it has been subjected in the past. As Mr. Mills so well said in his discussion of Mr. Stephenson's paper, "The present times are giving new importance to the trade journal."

Coke and Pig-Iron Production

The production of beehive and by-product coke in the ten weeks ended June 1, according to the weekly reports of the Geological Survey, averaged 1,133,000 net tons a week, and the fluctuations in tonnage from week to week were slight. The annual production rate indicated is 58,900,000 tons.

According to the experience in 1916 such a supply of coke would be practically sufficient for the requirements of the blast furnace industry, even with its increased productive capacity due to the erection of new furnaces; but according to the experience of 1917 it would not be sufficient. There is a curious alignment in the production figures from 1916 to 1917 on which more light would be desirable. There was an increase of 2,000,000 tons in the production of coke from 1916 to 1917, according to the preliminary figures issued for the latter year, while there was a decrease of 800,000 tons in the production of pig iron. This would point to a great increase in the consumption of coke per ton of pig iron, due to irregular working of blast furnaces and also to poor quality of coke. When the statistics of coke consumption per ton of pig iron

in 1917 are available, and when the final figures of coke production are reported, a more precise study can be made.

The proportion of the total coke output that has been used by iron blast furnaces has been as follows, in per cent: 1912, 81.3; 1913, 80.5; 1914, 78.3; 1915, 80.0; 1916, 81.2. This shows that the proportion is about 81 per cent when times are good, and when there is light demand for pig iron the blast furnace consumption of coke decreases more than the consumption in other directions.

With a productive rate of 58,900,000 tons of coke a year and a proportion to blast furnaces of 81 per cent, the blast furnaces would be furnished 47,700,000 tons, and at the ratio that obtained in 1916, 112 to 100, the total production of pig iron should be 42,600,000 tons. Of course, the more precise method would be to make the comparison upon coke iron only, rather than upon the total, but the comparison of totals is amply accurate for this purpose. The actual rate of pig iron production, however, as indicated by the monthly blast furnace reports of THE IRON AGE, was 40,400,000 tons in April and 40,900,000 tons in May, or an average of 40,650,000 tons, which is 2,000,000 tons a year less than would be expected from the above comparison.

It is quite improbable that more coke than usual is being used otherwise than in blast furnaces, and the conclusion is that there has not been, either in 1917 or in this year to date, the same efficiency in the production of pig iron from the weight of coke available that obtained in 1916. It is well known that much of the coke shipped in the winter was of relatively poor quality, while the furnaces worked irregularly in addition, and in the restoration of activity that occurred in the late winter and early spring it was noticed that pig iron production increased more than coke production, indicating an increase in efficiency. This increase, however, must go farther and the presumption is that it will.

The coke production statistics show a large increase in the proportion of by-product coke, the proportions lately being 58 per cent beehive and 42 per cent by-product. In 1916 the proportions were 65 per cent and 35 per cent. With the many new by-product ovens to be completed in the next few months the proportion of by-product coke will become still larger, and the proportions may be half and half in the not distant future.

CORRESPONDENCE

Congressional Slowing Up of Munition Making

To the Editor:—Legislation tending to slow up production of munitions of war may be conceived in ignorance or intolerance, but whatever its conception it is a dangerous factor at this time of dire need of everything required by our fighting forces. Congress has attached to the Army and Navy appropriation bills riders which prohibit, in connection with all work in Government plants, paid for out of those billions of dollars, the use of the bonus system of wages and its companion element of industrial management, the time study, which latter has come to be symbolized by the stop watch.

Never in the history of the nation has there been such crucial need of speeding up industry as exists

to-day. Never have the possibilities of disaster from the slowing down of industry been so great. At any cost the Army and Navy must have munitions and supplies with the least possible delay. To manufacture at top speed, mills and shops must be encouraged to use every help that engineering skill can give them. Congress might well compel rather than prohibit the use of the bonus and other features of scientific management.

While the anti-efficiency riders do not apply to private plants, the effect of a Congressional ban upon time studies and bonuses can only be detrimental to the morale of all metal-working plants. Manufacturers are laboring under serious handicaps. Many of them have contracts on the cost-plus basis and do not suffer from labor restrictions, but the owners are loyal men who chafe at reductions in the speed and volume of output from what they know it should be and could be. Skilled labor is utterly insufficient, and ordinarily intelligent unskilled labor is none too abundant. The country's capacity for producing equipment with which to manufacture war supplies is entirely inadequate under present-day conditions. Numbers of plants are taking on work with which many of their employees are unfamiliar and for which the equipment is not specially fitted. Many new plants, some of them on an unprecedented scale, have been created and their systems of production must be built up from nothing. And it must not be lost sight of that many establishments are now using the bonus system and time studies, so that the Congressional ban is found to exert a disorganizing influence.

A common problem to-day is to train a green operative to produce work rapidly and with a minimum of spoiled pieces, using a makeshift machine. The only possible way of solving these difficulties is the time study. To each available machine must be apportioned that share of the work to which it is best suited, and its most efficient speeds and feeds must be determined. The handling of the work by the operative must be studied in a similar manner, that the correct cycle of human effort may be obtained. These being standardized, the instruction of men and women becomes a comparatively simple matter, not only where the new hand has had previous experience, but also where there is absolutely no knowledge of machinery, as in the case of women who have taken up war work, or of those drafted men whose activities will be transferred from non-productive occupations or lack of occupations to munition work.

Europe has learned and adopted under the stress of munition production pretty much all there is to know about scientific management as it applies to the manufacturing end of business, a fact which may make itself felt when the war is ended. Time studies and bonus systems are encouraged rather than discouraged. In a recent number of *London Engineering* the subject is treated at length editorially. The writer, in summing up the meaning of scientific management, says: "The manager has projected his mind forward through the series of operations to be performed and has satisfied himself that he has made the best use of the means at his disposal." Such a projection of mind cannot be made without that element of planning known as time studies. The rule of thumb will not serve.

It has been demonstrated again and again that under conditions as they exist in normal times where a plant has been manufacturing a given product for years and has then applied engineering methods with a view to increasing production and at the same time to maintaining or bettering quality, the production gain has been from 10 to 25 per cent, and even higher. Under abnormal conditions, such as those resulting from the war, the difference would be far greater. Therefore under these prohibitions by Congress production would be less and consequently slower, which will reckon into delays of weeks and months. Applied to guns of all descriptions, shells, grenades, depth bombs, trucks, tanks, aeroplanes, ships, railroad equipment—all of the great list—the thought is not a pleasant one.

JOHN NELSON.

Worcester, Mass., June 10, 1918.

OBITUARY

FRANK H. BUHL, for many years a leading pig iron and steel manufacturer in the Shenango Valley, Pa., district, but not active in business since shortly after the organization of the United States Steel Corporation, died at his home in Sharon, Pa., Friday, June 7. Mr. Buhl was born Aug. 3, 1848, in Detroit, the son of Christian H. Buhl, the first mayor of Detroit. He spent his boyhood days in Detroit, and went to Sharon after several years at Yale University. He began his career as a clerk for the Sharon Iron Co., in which his father was a stockholder. His ability won him promotion and he became manager of the company, and later purchased control. From that time until 1902, he had been actively engaged in the iron and steel business. He practically built South Sharon, where the blast furnace and steel works of the Carnegie Steel Co. are located.

After retiring from the steel industry, Mr. Buhl and the late Peter L. Kimberly formed the Buhl-Kimberly Corporation, which promoted a vast irrigation project at Twin Falls, Idaho, by which 300,000 acres of land were developed and made fruitful. The corporation also was engaged in the mining of gold, silver and copper throughout the West. It built the street car lines as well as the steam railroad lines in Manila, P. I., after they were taken possession of by the United States. For the last few years, Mr. Buhl had done little in the way of active participation in business, but spent most of his time at his home and traveling. Mr. Buhl's philanthropy covered a wide scope, but his greatest gifts were to Sharon, where he accumulated a large part of his fortune. He built the Buhl Club and gave it to that city at a cost of \$350,000. He assisted in the erection of a large addition to the Buhl Hospital. He gave the Sunshine Society a handsome three-story building wherein to conduct its work and erected the Buhl Armory for the Independent Buhl Rifles. He spent more than \$1,000,000 to complete and beautify the Buhl Farm-Park. He is survived by his wife.

Braeburn Steel Co. Sold

The Marlin-Rockwell Corporation, New York, has purchased control of all the interests of the Braeburn Steel Co., general offices in the Henry W. Oliver Building, Pittsburgh, and works at Braeburn, Pa., about 20 miles from Pittsburgh, on the Allegheny Valley division of the Pennsylvania Railroad. The new owners took possession of the plant on June 7, and will operate it in the future. William Metcalf, Jr., president of the company since the death of his father many years ago, retires as president, and W. H. Rockwell succeeds him. George H. Neilson is vice-president and secretary, in charge of operations, J. R. Bell is treasurer, and Frank P. Case remains in charge of sales under the new organization. The plant of the Braeburn Steel Co., contains one 34-pot and one 36-pot crucible furnaces, a 6-ton Heroult furnace, 14-in. and 10-in. finishing mills, a full complement of 500-lb. to 7-ton steam hammers, a 500-ton hydraulic forging press and annealing and heating furnaces. The company has a monthly capacity of 750 tons of high speed and tool steels. It has a site of 33½ acres at Braeburn, a good part of which is occupied by the plant.

The Marlin-Rockwell Corporation also owns the Marlin Fire Arms Corporation and the Standard Roller Bearing Co., the latter of Philadelphia, and its main object in purchasing the plant of the Braeburn Steel Co. was to have a regular source of supply of high speed and tool steels needed by these two plants. However, they will not take the entire output of the Braeburn plant, and the remainder will be sold in the open market. The company expects to have sufficient surplus material to take care of its former regular customers.

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TO SAVE IRON AND STEEL

Stove and Furnace Manufacturers Make Recommendations

WASHINGTON, June 11 (*By Wire*)—Representatives of the stove and furnace manufacturers have concluded conferences with the conservation department of the War Industries Board regarding a program that is necessary to meet war conditions and assist in the saving of iron and steel, fuel, transportation and labor.

The furnace manufacturers have suggested action which would mean a reduction of 75 per cent of the styles and sizes of furnaces now on the market. The stove manufacturers have recommended that no new styles or sizes of stoves be placed on the market for the period of the war, and representatives are now working out a detailed program of eliminating styles and sizes that are not really necessary. This will be taken up with the retail dealers before any definite action is decided upon.

This is regarded as especially important as a means of saving iron and steel, so essential to the country at present. It will enable the stove and furnace manufacturers to adjust their business to war conditions and to prepare for any war emergency that may come. Such action taken now, the officials declare, may make unnecessary more drastic steps or prevent a serious situation later. Stocks of dealers will be smaller and move more rapidly, and less capital will stand useless because tied up in inactive stocks.

Similar lines of conservation have been worked out in shoes, clothing, paints, etc., with others planned for the near future, including the standardization of agricultural implements.

Effective May 28, the freight rate on articles of iron and steel manufacture, aside from wrought iron and steel pipe, in carload lots from Pittsburgh to Buffalo, via the Bessemer & Lake Erie Railroad, was advanced from 11.6 cents to 13.5 cents per 100 lb.

Cast Pipe Rate Declared Unreasonable

WASHINGTON, June 11.—The American Cast Iron Pipe Co. is awarded reparation in a decision rendered by the Interstate Commerce Commission on 13 carloads of cast iron pipe shipped from North Birmingham to Watervliet, Mich., and the rate of \$5.37 per net ton charged thereon by the Louisville & Nashville and other connecting lines is held to be unreasonable and a violation of the fourth section of the Interstate Commerce act to the extent that it exceeded \$5.11.

The shipments aggregated 644,193 lb. and moved over the lines of the defendant roads through La Crosse, Ind. Charges were collected in the sum of \$1,704.73. A rate of \$5.37 was published to Holland, Mich., on the Pere Marquette Railroad 48 miles beyond Watervliet and legally applicable to the latter point by intermediate application. A rate of \$5.11 applies on cast-iron pipe from North Birmingham to points on the Pere Marquette north from New Buffalo to and including Benton Harbor, Mich., which is 12 miles south of Watervliet; and to Grand Haven, Muskegon, Grandville, Grand Rapids, Sparta, Greenville and Ionia, Mich. Some of the latter points are a considerable distance beyond Watervliet. This rate also applies by way of the Michigan Central Railroad to Kalamazoo, South Haven and Grand Junction, Mich., the latter point also being located on the Pere Marquette, 20 miles north of Watervliet. The rate to Grand Rapids by way of the Pere Marquette applies through Watervliet.

Applications were made by the defendant roads in this case for authority to continue to charge for the transportation of cast-iron pipe in carloads from Birmingham and North Birmingham to Grand Rapids rates which are lower than those contemporaneously maintained on like traffic to Watervliet and other intermediate points, but the commission holds they should be denied. After a review of all the evidence, it is held that the rate legally applicable for the future may not exceed \$5.11 per net ton. The commission further finds that the complainant made the shipments described and paid the charges thereon and that, as it has been damaged to the extent that the charges exceed those that would have accrued at the rate herein found reasonable, it is entitled to reparation in a sum equal to the overcharge with interest.

New Blast Furnace and Coke Ovens at Weirton, W. Va.

The Phillips Sheet & Tin Plate Co., which will build a 500-ton blast furnace at Weirton, W. Va., has placed a contract for two blowing engines with the Mesta Machine Co., Pittsburgh, while the contract for all the steel work for the furnace proper and three hot blast stoves has been placed with John Mohr & Sons, Chicago. The Phillips Sheet & Tin Plate Co. will also build either 44 or 47 by-product coke ovens at Weirton, the contract for which is likely to be placed this week.

Sixty new coke ovens being erected at the Steelton, Pa., plant of the Bethlehem Steel Corporation will be completed some time next month. With the new ovens there will be 180 ovens in service at the Steelton plant. The ovens are being built by the H. Koppers Co., Pittsburgh.

In the war chest of over \$1,000,000 recently raised at Youngstown, Ohio, the Republic Iron & Steel Co. subscribed \$85,000, and its 8501 employees subscribed a total of \$195,275.44, an average to each employee of \$23.09, or 96.7c. per pay.

British exports of iron and steel for the first quarter of 1918 were 389,649 gross tons, against 627,406 tons in the corresponding quarter of 1917, 866,159 tons in that of 1916, and a quarterly rate of 1,250,000 tons before the war.

Government Shell-Loading Plants

The first of the great Government plants for the filling of shells with explosives has been completed. Operation began last week, the Acting Chief of Ordnance, Gen. C. C. Williams, has advised the Secretary of War. This plant was put up for the Government by a private company.

A second plant is expected to start operation later this month, with a third beginning in July, and the fourth in August. They were authorized by Congress in December, to cost \$5,000,000 each, and they will range from 2000 to 6000 acres in extent.

Plans call for a total daily loading in these four plants of 100,000 75-mm. shells, 48,000 155-mm. shells and 16,000 8-in. and larger. Two of the plants will, in addition, be called on for 15,000 4.7-in. shells daily.

These shells will be in addition to the heavy production of private plants working on Government contracts. Six plants are loading 75-mm. shells; two on 155-mm.; four, 4.7-in. shells; and two on 8-in. and larger. Three private factories already are loading 150,000 fuses and boosters daily, and a fourth plant is almost ready for production. Four Government plants will be added to these as rapidly as they can be built. Five plants are busy loading shrapnel, turning out a total of 75,000 daily, divided among 75-mm., 155-mm. and 4.7-in. sizes.

The Ordnance Department expects an important part to be taken by women in this work. Of the 16,000 laborers who will start work on shell loading for the Government 4000 will be women. Ultimately it is expected that 60 per cent of the total employed will be women.

Large Lake Ore Shipments in May

Iron-ore shipments from the Lake Superior region in May were nearly 40 per cent larger than in May, 1917. The total last month was 8,792,231 gross tons, as contrasted with 6,283,612 tons in May, 1917. This is an increase for May, 1918, of 39.92 per cent. The comparative shipments by ports for May, 1918, and for the season were as follows in gross tons:

	May, 1917	May, 1918	To June 1, 1917	To June 1, 1918
Escanaba	1,105,086	655,495	1,295,493	655,495
Marquette	98,048	495,043	98,048	505,751
Ashland	732,951	898,148	732,951	898,147
Superior	1,383,294	2,088,029	1,404,419	2,187,591
Duluth	1,765,683	3,055,083	1,765,683	3,112,074
Two Harbors	1,198,550	1,600,434	1,198,550	1,669,043
Total	6,283,612	8,792,231	6,495,144	9,028,101
Increase, 1918 ..		2,508,619		2,532,957

The increase to June 1, 1918, is 39 per cent over 1917, or 2,532,957 tons. The Duluth and Superior percentage of the total to June 1 this year was 58.70, against 48.81 last year, but the Escanaba proportion this year is much less than last year, or 7.26 per cent, compared with 19.94 per cent. It is less than in 1915 when it was 9.59 per cent.

To Build 40 Concrete Vessels

Contracts for building 40 concrete ships of 7500 tons each in five Government yards have been awarded by the Shipping Board. Eight ships will be built at each yard, with A. Bentley & Sons Co. in charge at Jacksonville, Fla.; Fred J. Lay & Co., at Mobile, Ala.; Schofield Engineering Co., at San Diego, Cal.; San Francisco Shipbuilding Co., at San Francisco, and the Liberty Shipbuilding Co., at Wilmington, N. C.

The exports of tin, terne and black plates by sea through the principal ports of the Swansea district during 1917 were the lowest on record, amounting to only 188,300 long tons compared with 551,191 tons in 1913.

The United Alloy Steel Corporation, Canton, Ohio, has placed in operation an additional Heroult electric furnace of 15-ton capacity. The plant is now operating two 15-ton and one 6-ton Heroult furnaces.

Working on a Bill to Raise Four Billions

Ways and Means Committee of House Finds Task
Beset by Difficulties—Results of Price Fixing
Considered—May Repeal Internal Revenue Laws

WASHINGTON, June 11.—On the threshold of the great undertaking of framing a new revenue bill to raise \$4,000,000,000, the bulk of which, according to the Administration's views, should be obtained from so-called war profits, the Ways and Means Committee has made the disconcerting discovery that the net earnings of the big corporations for the current calendar year have already been heavily invaded through the price-fixing agreements negotiated by the War Industries Board. These agreements cover iron and steel, copper, lead, zinc, aluminum, petroleum and many other important commodities and are supplemented by price stipulations promulgated by the Fuel and Food Administrators. To what extent these limitations of prices will curtail profits for the current year the committee cannot now determine, but the probability of disappointing returns is believed to be materially increased by the strong upward trend in the cost of labor and material of all kinds, especially during the past six months. An immediate sifting of all available information concerning this important phase of the revenue problem has been undertaken and the results may have an important bearing upon the price-fixing policy to be pursued hereafter. It goes without saying that the committee will be obliged to take this factor into account in framing the new excess profits tax provision and may be obliged to choose between the imposition of almost prohibitory rates on corporate profits and the shifting of the burden to some other source of revenue.

Chairman Brookings' Views

In launching its investigation of this serious problem, the committee summoned Robert S. Brookings, chairman of the Price-Fixing Committee of the War Industries Board, and devoted an extended executive session to an effort to arrive at an estimate of the practical effect of the board's price-fixing policy upon the net earnings of the principal corporations with which the board has made agreements. Mr. Brookings described in detail all the outstanding price schedules and gave the committee much information as to the manner in which they were framed and the arguments presented at the conferences by representatives of those corporations which sought higher prices. It was impossible, he said, to indicate the exact effect of the price agreements upon earnings, but that it was very substantial could not be denied. It would be practicable, he thought, to obtain current market prices at the time the agreements were negotiated and this would form a basis of comparison with the prices determined on, but, obviously, it would be impossible to say to what extent the market would have risen had no price control been attempted by the Government.

Effect of Price Reductions

Mr. Brookings was examined at some length as to the extent of the price reductions secured by the War Industries Board and as to their effect upon manufacturers in the respective industries. He assured the committee that the reductions were not exaggerated and in the aggregate would represent enormous savings to the Government. Certain members of the committee are of the opinion that the economies already effected in purchases made at the prices fixed by the board should be taken into account in determining the contributions to be exacted of the corporations under the new war profits tax, and it also felt that if a large sum is to be derived by this means, it may be necessary, in view of rising costs of material and labor, to counterbalance material increases in current prices when existing schedules are again revised. The fact that the iron

and steel schedule will expire in less than three weeks and must soon be taken up for revision raises some interesting possibilities in view of the evident determination of Congress to obtain a maximum amount of revenue by levying upon corporate war profits.

The attention of the Ways and Means Committee has been drawn in this connection to the effect of Government price fixing upon the earnings of the smaller corporations in the leading industries covered by the existing agreements with the War Industries Board. While the majority of the agreements have been made with a view to stimulating production, it is doubtful whether any of them have taken into account the industrial position of many small producers who are unable to exist on prices which show the large, well integrated concerns' very comfortable profits. The board has taken the position that there is a certain element in every industry that, by reason of geographical location, poor transportation facilities, scanty labor supply, uneconomical manufacturing methods, etc., has no "license to continue in business." In the runaway market that characterized a number of the leading industries before the Government undertook to control prices these unfavorably situated concerns made money, but it is doubtful whether any of them will show excess war profits during the current calendar year. In the aggregate this loss to the Government will be considerable and members of the Ways and Means Committee regard it as a factor in the big problem that is far from negligible.

Difficult to Estimate

In his testimony before the committee, Mr. Brookings not only expressed his inability to approximate the effect of price fixing on the profits of the corporations, but he also said that he did not wish to be understood as giving an opinion that the aggregate taxes that would be paid by the corporations for the calendar year 1918, should the law of Oct. 3, 1917, be continued in force, would be smaller than those collected for 1917. Increased production had been a notable feature of many industries, he said, and it would be very difficult to estimate the influence of this factor upon the net result, especially as it would be more or less complicated by the item of increased cost which had not affected all trades alike.

The Ways and Means Committee has decided that in place of enacting a supplemental law to raise \$4,000,000,000, it will write a new statute raising approximately \$8,000,000,000, at the same time repealing the existing internal revenue taxing laws. This will bring order out of chaos in so far that the average business man will be able to estimate his own income tax and the taxes to be paid by the corporations in which he is interested. The rewriting of the excess profits tax law will be a legislative reform of the highest importance and the outcome will be awaited with great interest, especially in the big financial centers. The present disposition of the committee is to go back to the English law which fixes war profits at the earnings of the taxable year in excess of the average gains of the three years constituting the so-called pre-war period, 1911, 1912 and 1913. This system, however, will probably be modified in certain particulars so as to obtain contributions from corporations which made profits as large before the war as at the present time and which on the English basis would pay nothing. This adjustment presents some difficulties, especially in view of the Administration's strong disposition to lay a heavy hand on all gains which can be regarded as strictly war profits.

W. L. C.

Iron and Steel Markets

IN GOVERNMENT HANDS

Distribution of Iron and Steel Taken Over

Sweeping Priority Requirement on Which the Steel Trade Seeks Light

In an order dated June 6, that no one in the steel trade fully understands, the War Industries Board has put in the hands of J. L. Repogle, Director of Steel Supply, the distribution of the entire iron and steel output of the country. Starting with the sweeping provision that no pig iron or steel products shall be shipped except under priority certificates, the order provides that after all priority requisitions have been filled producers may supply their customers if the latter are on a preferred list, which, as revised, is to be sent out later.

As yet no direct notification of the new order has come to producers, nor has the operation of Government priorities as carried on for many weeks been changed. Requests for interpretations have poured in upon Washington, but thus far no official answer has been given to the urgent requests of various industries to know whether they will have much, or little or no steel from this time forth.

The fact is that to-day no accurate estimate exists or can be made of the Government's steel requirements. Only this week various departments have sent to the Director of Steel Supply additions of not less than 3,000,000 tons to the estimates previously submitted and the programs of the Shipping Board and the Ordnance Bureau are still expanding.

It is believed that various users of pig iron and of finished steel who have had full or partial supplies up to this time will get none in the remainder of the year, but no information can be had as to their identity, for no man in Washington has such information.

One official estimate is that the Government will take at least 85 per cent of the output for strictly war purposes, so that after all allocations are made to the second or preferred list no surplus would be expected for distribution under the "approval in writing of the Director of Steel Supply." Yet there is official sanction for the view that "there may be from time to time considerable quantities of iron and steel for general consumption."

Pending real light on the new order, many producers are going on as heretofore. Much pig iron has been going to foundries not engaged on war essentials. Some furnace companies have already notified such customers that further shipments cannot now be made.

Steel makers have been puzzled by the repeated reports in the past week, even though promptly denied, that the Government would take over the industry in an operative way. Yet the resolutions of the War Industries Board expressly provide for the continued co-operation of the steel manufacturers' committee.

Some sellers welcome the new order of things as leaving the consumer free from doubts as to reason

for a refusal to accept business. They feel, also, that there has been some breaking of the 100 per cent pledge, not in letter but in spirit.

Lake Superior iron ore producers met in Chicago Tuesday with the Committee on Steel and Steel Products of the American Iron and Steel Institute to present grounds for an advance in ore prices following the freight advance of 33.6c. per gross ton and two wage advances this year. An unexpected burden will fall on blast furnaces if the view prevails that all ore in transit or on lower Lake docks on June 24 (the latter amounting to several million tons) must pay the 33.6c. increase when it is shipped to the furnace companies.

Steel ingot production in May, unlike that of pig iron, shows a slight falling off from the April rate. In 27 working days, May 30 not being a steel works holiday, the output of companies which made 88 per cent of the country's total in 1916 was 3,256,965 gross tons, or 120,628 tons a day, against 3,163,410 tons in April, or 121,670 tons a day. The May rate, estimating companies not reporting, would mean about 42,300,000 tons a year.

The jobbers of iron, steel and hardware have been called by the Priorities Board to meet with it in Washington June 13 to consider how the Government may help in applying warehouse stocks to essential uses. This recognition of the distributor is noteworthy in view of intimations some months ago that he might be eliminated.

Pittsburgh

PITTSBURGH, June 11—(By Wire).

The local steel trade has accepted cheerfully the regulations agreed upon at Washington by the War Industries Board and the general committee of the American Iron and Steel Institute by which the entire supply of iron and steel shall be shipped and delivered only under priority certificates issued by the Priorities Division of the War Industries Board. This means that no market exists to-day in iron and steel products, every ton of which is now under control of the Government. It further means that companies not making material classed as war essentials will not be able to get any pig iron, semi-finished or finished steel products for a considerable time and some may have to go out of business during the life of this arrangement. The distribution of steel under Government direction according to the schedule given out on June 6 is regarded by the trade here as fair, and satisfaction has been expressed over the fact that the War Industries Board and the Steel Committee reached such an agreement. It will simplify methods of doing business in iron and steel and put squarely on the Government the responsibility for the distribution of about 3,000,000 tons of steel ingots, semi-finished and finished steel per month. It is a hardship on the small companies, but it is claimed that no companies making war essentials will suffer for lack of raw materials, being in reality helped, as steel now going into non-essentials will be diverted for their use. So far as known, there have been no complaints because of the new order, the effort being to put every ton of steel that can be turned out at the disposal of the Government.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	June 11, 1918.	June 4, 1918.	May 14, 1918.	June 13, 1917.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia....	\$34.25	\$34.25	\$34.25	\$46.75
No. 2, Valley Furnace....	33.00	33.00	33.00	50.00
No. 2 Southern, Cin'ti....	35.90	35.90	35.90	42.90
No. 2, Birmingham, Ala....	33.00	33.00	33.00	40.00
No. 2, furnace, Chicago*	33.00	33.00	33.00	50.00
Basic, del'd, Eastern Pa....	32.75	32.75	32.75	42.50
Basic, Valley furnace....	32.00	32.00	32.00	50.00
Bessemer, Pittsburgh....	36.30	36.30	36.15	55.95
Malleable, Chicago*	33.50	33.50	33.50	50.00
Malleable, Valley....	33.50	33.50	33.50	50.00
Gray forge, Pittsburgh....	32.75	32.75	32.75	47.95
L. S. charcoal, Chicago....	37.50	37.50	37.50	52.00

	June 11, 1918.	June 4, 1918.	May 14, 1918.	June 13, 1917.
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	\$55.00	\$55.00	\$55.00	\$38.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	40.00
Bess. billets, Pittsburgh...	47.50	47.50	47.50	100.00
O.-h. billets, Pittsburgh...	47.50	47.50	47.50	100.00
O.-h. sheet bars, P'gh....	51.00	51.00	51.00	105.00
Forging billets, base, P'gh.	60.00	60.00	60.00	125.00
O.-h. billets, Phila....	50.50	50.50	50.50	95.00
Wire rods, Pittsburgh....	57.00	57.00	57.00	95.00

	June 11, 1918.	June 4, 1918.	May 14, 1918.	June 13, 1917.
Finished Iron and Steel,				
Per Lb. to Large Buyers	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	3.685	3.685	3.685	4.659
Iron bars, Pittsburgh....	3.50	3.50	3.50	4.25
Iron bars, Chicago....	3.50	3.50	3.50	4.00
Steel bars, Pittsburgh....	2.90	2.90	2.90	4.25
Steel bars, New York....	3.095	3.095	3.095	4.419
Tank plates, Pittsburgh...	3.25	3.25	3.25	8.00
Tank plates, New York...	3.445	3.445	3.445	8.669
Beams, etc., Pittsburgh...	3.00	3.00	3.00	4.25
Beams, etc., New York...	3.195	3.195	3.195	4.419
Skelp, grooved steel, P'gh	2.90	2.90	2.90	4.00
Skelp, sheared steel, P'gh.	3.25	3.25	3.25	6.00
Steel hoops, Pittsburgh...	3.50	3.50	3.50	5.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,

	June 11, 1918.	June 4, 1918.	May 14, 1918.	June 13, 1917.
Per Lb. to Large Buyers	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	5.00	5.00	5.00	8.00
Sheets, galv., No. 28, P'gh	6.25	6.25	6.25	9.50
Wire nails, Pittsburgh...	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh...	4.00	4.00	4.00	4.00
Fence wire, base, P'gh...	3.25	3.25	3.25	3.45
Barb wire, galv., P'gh...	4.35	4.35	4.35	4.35

Old Material, Per Gross Ton:

Carwheels, Chicago....	\$29.00	\$29.00	\$29.00	\$36.00
Carwheels, Philadelphia.	29.00	29.00	29.00	35.00
Heavy steel scrap, P'gh.	28.50	28.50	28.50	42.00
Heavy steel scrap, Phila...	29.00	29.00	29.00	32.50
Heavy steel scrap, Ch'go	29.00	29.00	29.00	35.00
No. 1 cast, Pittsburgh...	28.50	28.50	28.50	35.00
No. 1 cast, Philadelphia.	29.00	29.00	29.00	32.00
No. 1 cast, Ch'go (net ton)	27.00	27.00	27.00	30.00
No. 1 RR. wrot, Phila...	34.00	34.00	34.00	50.00
No. 1 RR. wrot, Ch'go (net)	29.75	29.75	29.75	40.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$6.00	\$6.00	\$6.00	\$11.00
Furnace coke, future....	6.00	6.00	6.00	9.50
Foundry coke, prompt...	7.00	7.00	7.00	12.00
Foundry coke, future....	7.00	7.00	7.00	10.00

Metals,

	June 11, 1918.	June 4, 1918.	May 14, 1918.	June 13, 1917.
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.	23.50	23.50	23.50	32.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	32.50
Spelter, St. Louis.....	7.37 1/2	7.25	7.12 1/2	9.50
Spelter, New York.....	7.62 1/2	7.50	7.37 1/2	9.75
Lead, St. Louis.....	7.12 1/2	6.92 1/2	6.70	11.87 1/2
Lead, New York.....	7.25	7.05	6.90	12.00
Tin, New York.....	90.00	90.00	\$1.00	60.62 1/2
Antimony (Asiatic), N. Y.	12.75	12.25	12.75	20.00
Tin plate, 100-lb. box, P'gh.	\$7.75	\$7.75	\$7.75	\$10.50

It is the general belief that few price changes, if any, will be made at the meeting of the War Industries Board to be held late this month to act on prices for third-quarter delivery. Now that the Government has practically taken over the entire steel output, simply giving directions as to where the steel shall be shipped, it is not likely to take action that would cause it to pay higher prices. As yet formal notice has not been received by the steel trade here of the June 6 resolutions of the War Industries Board, but the official announcement is expected at any time.

Pig Iron.—The survey of the pig iron trade under way for nearly a month has been greatly delayed because of failure of some blast furnaces and more foundries and other consumers of pig iron to send in their reports. At a meeting of the Pig Iron, Lake Ore and Transportation Committee in Cleveland this week it is expected that some action will be taken to compel concerns that have not filled out and sent in their questionnaires to do so at once. The new inquiry for pig iron is heavy, with practically none to be had. We note a sale of 3000 tons of Southern off foundry iron at \$30.80, and also certificates for 3300 tons at \$31, both f.o.b. at furnace. Nearly all this iron has been resold to consumers in the South, but a good part of it went to Eastern consumers. It is very evident that a good deal of pig iron now being sent to consumers not making war essentials will be shut off and will be shipped to consumers making war essentials. Prices in effect until June 30 are as follows:

Basic pig iron \$32; Bessemer \$35.20; gray forge, \$32; No. 2 foundry, \$33; No. 3 foundry, \$32.50, and malleable, \$33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.10 per ton.

Billets and Sheet Bars.—The agreement reached between the War Industries Board and the general committee of the American Iron and Steel Institute simply means that the entire supply of semi-finished steel in the forms of billets and sheet bars will be handled by

the Government, shipments from the mills to consumers being made only when the latter furnish Government priority certificates. There will be a general switching around of shipments of steel, but it is not believed the supply to sheet and tin plate mills will be curtailed. There is still a shortage in supply of sheet bars, and this is cutting down output of sheets to a considerable extent.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$47.50, sheet bars \$51, forging ingots \$73, and forging billets \$60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferralloys.—The demand for ferromanganese in the past week has been more active. One leading consumer bought 2000 tons of 70 per cent for delivery in the last half of this year at \$250 per gross ton, delivered, and the same consumer bought 4000 tons of 16 to 18 per cent spiegeleisen for the same delivery at \$73.50, delivered. The Labelle Iron Works, Steubenville, Ohio, is credited with having bought 500 tons of 16 per cent spiegeleisen for early shipment at about \$72, delivered. Consumers of ferroalloys are now well covered over the remainder of this year.

We quote 70 per cent ferromanganese at \$250 delivered, 16 per cent spiegeleisen at \$65 to \$70 at furnace and 50 per cent ferrosilicon for prompt shipment at \$160 and for delivery over the last half of the year, \$150 to \$155 at furnace, the furnaces usually absorbing the freight.

We now quote 9 per cent Bessemer ferrosilicon at \$54; 10 per cent, \$55; 11 per cent, \$58.30; 12 per cent, \$61.60. We quote 6 per cent silvery iron, \$41; 7 per cent, \$43; 8 per cent, \$45.50; 9 per cent, \$47.50; 10 per cent, \$50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of \$2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—No details have come out in regard to the two new fabricating shops to be built by the McClintic-Marshall Co. It is said both of these may be located at Pottstown, Pa., where the company already has a plant, but this is not definitely settled. This company has taken 750 tons of steel for bridge work for the Pennsylvania Railroad, which is in-

quiring for 350 tons more. New inquiries in the market include 5000 tons for additions to the Essington (Pa.) plant of the Westinghouse Electric & Mfg. Co., and about 5000 tons or more for new works to be built by the Midvale Steel & Ordnance Co. All new structural work to be taken from now on will be under strict Government supervision, and priority certificates will have to be furnished by the customers. We quote beams and channels up to 15 in. at 3c. at mill, Pittsburgh.

Plates.—Under the new ruling by the War Industries Board, the Government has practically commandeered the entire output of plates, and from this time no consumers will receive plates from the mills unless they furnish Government priority certificates. Allocations have been almost completed for 922,110 tons of plates, shapes and bars to the mills for the 100,000 cars placed about a month ago by the Government. All plate mills are filled for this year. We quote $\frac{1}{4}$ -in. and heavier sheared plates at 3.25c. at mill, Pittsburgh.

Iron and Steel Bars.—The new order of the War Industries Board will likely shut off shipments of bars to some concerns not making materials classed as war essentials. We quote steel bars rolled from steel billets at 2.90c., from old steel rails 3c., and refined iron bars 3.50c. at mill, Pittsburgh.

Sheets.—The shortage in supply of sheet bars is growing worse, and the output of the sheet mills is being restricted to some extent. The independent mills are now operating at slightly less than an average of 80 per cent, while the American Sheet & Tin Plate Co. is running to about 65 per cent. Orders for sheets from the Government have been only fairly heavy for some time, but some large inquiries for blue annealed, black and corrugated sheets are likely to come out at any time, and a good part of the tonnage involved is for shipment to France. Mill shipments to jobbers have been cut off, except where the jobbers can furnish a Government priority order showing that the sheets are wanted for war essentials. In some cases, jobbers are able to procure sheets to replenish stocks where they can show these were depleted by the filling of Government direct or indirect orders. It is said the practice of a few jobbers in charging higher than the Government maximum price is to be stopped. Mills are filled up to October or longer. Prices on sheets, in effect until June 30, are given on page 1571.

Tin Plate.—It is said that makers of tin plate would be satisfied to have the present price of \$7.75 per base box continue in force for the second half of the year, if some plan were worked out by which they would be guaranteed a supply of pig tin at not over a certain price, about 70c. per lb. When the present price of \$7.75 for tin plate was fixed by the Government on Nov. 5, 1917, the price of pig tin was 60c. to 61c. per lb. Recently pig tin has sold at very close to \$1 per pound, and palm oil is also very much higher than last year. The manufacturers feel that if a maximum price on pig tin for second half of the year delivery of 70 to 75c. per lb. is secured for them by the Government they will not ask for an advance in price of tin plate. It is pointed out that our Government fixes maximum price on steel products sold by this country to France and England, and tin plate makers feel they are justified in asking for lower prices on pig tin and palm oil. Most consumers have covered their needs for second half of this year, and in cases where tin plate is wanted for other purposes than making food containers, these contracts subordinate to Government needs, and consumers have been so advised. Output of tin plate continues heavy, the mills operating to 95 per cent of capacity and running on tin plate for food containers only. We quote tin plate up to June 30 at \$7.75 per base box, f.o.b. Pittsburgh, rolled from Bessemer or open-hearth steel. The demand for terne plate is very light and its output is not being pushed by the mills. Prices on terne plate as given out recently by the War Industries Board are given on page 1571.

Steel Rails.—As yet nothing has been heard from the Government in regard to its expected orders for standard section rails, and nothing is known now as

to when these may come out. The inquiry for light rails is active, and most of the new business being placed is going to the re-rolling mills. The Government price on 25 to 45-lb. sections up to June is \$3 per 100 lb. f.o.b. Pittsburgh. Prices on standard section rails rolled from Bessemer steel are from \$60 to \$62, and on open hearth \$63 to \$65 at mill.

Cotton Ties.—When the cotton tie season opens, most makers cover the needs of their regular trade over the entire season, the prices on cotton ties for delivery starting July to be those fixed by the Government. However, under the recent agreement between the War Industries Board and the Committee on Steel and Steel Products, it is probable that all users of cotton ties will have to furnish Government priority orders for all ties they are to receive, starting July. It is assumed that the price on cotton ties for July delivery will be 2c. per bundle higher than for June, which would make the July price in lots of 3000 bundled and over \$1.95 per bundle, but this will not be definitely known until the War Industries Board acts on the price for third quarter, late this month. The price on cotton ties for the remainder of June shipments is \$1.92 per bundle of 45 lb. in lots of 3000 bundled and over; 2c. per bundle higher for less than 3000-bundle lots, f.o.b. Pittsburgh.

Wire Rods.—Several sales of rods, the carbon content running 0.70 to 0.75 per cent and higher, are reported at about \$90 per ton, f.o.b. mill Pittsburgh. A sale is also reported of 400 tons of soft Bessemer rods, delivery over four months, starting June, at the regular price of \$57, f.o.b. Pittsburgh. The demand for rods is fairly heavy, but as a rule mills are refusing to quote as their output of rods is very limited owing to the scarcity of steel, and they need almost their entire product for their wire mills. In the future mills will not make any sales of rods unless the customer furnishes Government priority order. Prices on rods, in effect until June 30 are given on page 1571.

Wire Products.—No large Government orders for wire nails or wire came out in the past week, but the mills are filled up mostly on Government work over the next three or four months. The Newport News Shipbuilding & Dry Dock Co. placed 4000 or 5000 kegs lately, and two of the steel car builders having Government orders have inquiries out for about 6000 kegs of wire nails. Mills report the commercial demand for wire and wire nails is very heavy, but under the agreement reached last week between the War Industries Board and the committee of the American Iron and Steel Institute, no new orders will be entered except for buyers with Government priority certificates. Jobbers' stocks are very badly depleted, and on the more common sizes are exhausted. The Government price on cut nails up to June 30 is \$4 per keg f.o.b. Pittsburgh. Prices on wire and wire nails up to June 30 are given on page 1571.

Hot-Rolled Strip Steel.—The present output of hot-rolled strip steel is probably not more than 60 to 70 per cent of normal, owing to the shortage in supply of steel. Probably 75 per cent of this limited output is being furnished to the Government on direct orders, or to concerns working on war essentials. The Government price for hot-rolled strip steel up to June 30 is \$3.50 per 100 lb., f.o.b. Pittsburgh. The list of extras and differentials that apply was given on pages 1357 and 1374 in THE IRON AGE of May 23.

Cold-Rolled Strip Steel.—Makers continue to report that 60 to 75 per cent of the present limited output of cold-rolled strip steel is going to the Government on direct and indirect orders. Output on the average is not over 60 per cent, due to the scarcity of steel and labor. In the future, makers of cold-rolled strip steel will not accept orders unless buyers furnish priority certificates, and on contracts already booked these will also likely be required. We quote cold-rolled strip steel at \$6.50 per 100 lb. f.o.b. Pittsburgh. Terms 30 days, less 2 per cent for cash in 10 days, when sold in quantities of 300 lb. or more; freight allowed to destination when it does not exceed 31c. per 100 lb.

Shafting.—Owing to the scarcity of steel and also labor, the output of shafting is not more than 65 to 75

per cent of normal, and makers report that 85 to 95 per cent of this output is being furnished to the Government on direct or indirect orders. From now on, all consumers sending in new orders must furnish priority certificates before they will be accepted by the mills. This will likely shut off shipment of shafting to a large number of users that are said not to be working on strictly war essentials. This may also include builders of pleasure cars, but this is not definite. We quote cold-rolled shafting at 17 per cent off list in carloads, and 12 per cent in less than carloads, f.o.b. Pittsburgh.

Nuts and Bolts.—Makers report that 75 to 85 per cent of their limited output is going to the Government on direct and indirect orders. Makers now are working on the recent order for 129,000,000 bolts placed by the Government, delivery running over the remainder of this year. The inquiry from the Ordnance Department for 40,000,000 bolts has not come out, but is expected at any time. The shortage in supply of steel and also in labor is restricting the output of nuts and bolts considerably. Makers report the commercial demand very heavy, but will not require Government priority certificates before accepting any new orders. It is not expected there will be any change in present discounts for third quarter. Government discounts in effect until June 30 are given on page 1571.

Rivets.—A meeting of rivet makers is to be held in New York on Wednesday June 19 to discuss prices which they believe are too low, and to agree upon a plan for presenting their case at Washington. Rivet makers claim that with the high costs of steel and labor, present prices do not allow any profit, and some makers claim they can not come out whole. The Government is still taking 85 to 90 per cent of the output of rivets on direct and indirect orders. On all new orders, consumers will have to furnish Government priority certificates before the makers will accept them. We quote conehead structural rivets at \$4.40; conehead boiler rivets at \$4.50 per 100 lb. and small rivets 50 and 10 per cent off list f.o.b. Pittsburgh.

Hoops and Bands.—Makers of hoops and bands are shipping practically their entire output on Government direct or indirect orders, and the demand for hoops for cooperage purposes is reported very heavy. The demand for bands is not so active, and one or two concerns will likely make fewer bands in the future, and turn their steel into strictly war essentials. We quote steel hoops for cooperage purposes and steel bands at \$3.50 per 100 lb. f.o.b. Pittsburgh. Extras and differentials in effect are those given on pages 1357 and 1374 in THE IRON AGE of May 23. Hoops and bands now carry the same extras and classification.

Spikes.—The recent inquiry of the Pennsylvania Lines West for 9000 kegs of spikes was reduced to 3000 kegs, of which one local maker took 1200 kegs and another about 1800 kegs. The Baltimore & Ohio placed about 1000 kegs. The recent inquiries of the Norfolk & Western for 8000 kegs and the Nickel Plate for 1700 kegs have not been closed. The demand for boat and small spikes is abnormally heavy, and makers are sold up for four or five months.

Standard sizes of railroad spikes 9/16 x 4½ in. and larger, \$3.90 per 100 lb. in lots of 200 kegs of 200 lb. each, or in larger lots. Boat spikes, \$5.25 per 100 lb., track bolts, \$4.50 base in lots of 200 kegs or more; less than 200 keg lots, \$1 per 100 lb. extra. All f.o.b. Pittsburgh.

Skelp.—This material can not be obtained for early delivery, as mills rolling it are sold up for practically the remainder of this year. In any event, mills that could take on material for late in the year delivery will demand priority certificates before entering any new orders.

We quote grooved skelp at \$2.90; universal skelp, \$3.15, and sheared skelp, \$3.25 base. Special skelp for boiler tubes, etc., is \$3.40 for base sizes and \$3.55 for other sizes, all prices being per 100 lb., f.o.b. Pittsburgh.

Wrought Pipe.—Mills report that 85 to 90 per cent of the entire output of iron and steel pipe is going to the Government, mostly on direct orders, a good deal of pipe having been shipped to France in the last several months for Government work being done in that coun-

try. No large gas or oil lines are in the market, as the mills are not in position to quote and make delivery this year. One leading maker has under contract practically every ton of steel pipe it will make into June of next year. The commercial demand is fairly active and in all cases mills will now insist on Government priority certificates before filling any new orders. Discounts on iron and steel pipe are given on page 1571.

Boiler Tubes.—On iron and steel tubes, mills are sold up for months, practically the entire output going to the Government. The Government demand for seamless steel tubing is so heavy that there is a great shortage in the supply and as noted in our report last week, tentative plans are under way for the building of two large seamless tube mills, probably in the Pittsburgh district. The leading maker of seamless steel tubing has a good part of its output for all of next year already under Government contract. Discounts on iron and steel tubes in effect until June 30 are given on page 1571.

Old Material.—Dealers say that under the new agreement reached between the War Industries Board and the general committee of the institute, they will refuse to make sales of scrap unless buyers furnish Government priority certificates. Dealers report that there is more trouble in getting shipment of scrap, but this does not particularly affect them, as they are not able to find much material to sell to the mills. The shortage in supply of scrap is getting more acute, and most dealers have handled very little in the last three or four months. A good part of the Pennsylvania Railroad scrap was sold direct to consumers, very little of it being obtained by dealers. Prices on iron and steel scrap, effective from April 1, nearly all fixed by the Government, in effect until June 30 for delivery in Pittsburgh and other consuming points that take Pittsburgh freights are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$28.50 to \$29.00
No. 1 cast scrap (for steel plants)	28.50 to 29.00
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh	33.00 to 34.00
Hydraulic compressed steel scrap	26.00 to 27.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 railroad malleable scrap	28.00 to 29.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock (un-guaranteed)	34.00
Low phosphorus melting stock (guaranteed)	36.50
Low phosphorus melting stock (bloom and billet ends, heavy plates)	39.00
Iron car axles	46.00 to 46.50
Locomotive axles, steel	46.00 to 46.50
Steel car axles	46.00 to 46.50
No. 1 bushing scrap	26.00 to 27.00
Machine shop turnings	18.00 to 19.00
Cast iron wheels	28.00 to 29.00
Rolled steel wheels	34.00 to 36.00
Sheet bar crop ends (at origin)	34.00 to 35.00
Cast iron borings	18.50 to 19.00
No. 1 railroad wrought scrap	33.00 to 34.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	28.00 to 29.00

Coke.—The supply of coke in the past month has been so plentiful that some furnaces have been able to accumulate fairly large stocks. Often there is a small supply of free coke, and this is usually offered as foundry, which brings a higher price than furnace. There are not many contracts for foundry coke in existence and for this reason the new demand is active. Some brokers are handling coke without profit, buying and selling it at the same price, merely to keep in business. There are no contracts being made for furnace coke, shippers sending their customers their supply and billing them from month to month. There are still some contracts for furnace coke, made before prices were fixed by the Government, at as high as \$8 and \$8.50 per net ton at oven, and on these furnaces are taking this fuel promptly. The output in the upper and lower Connellsville regions for the week ending June 1 was 343,020 tons, an increase over the previous week of 2920 tons. We quote 48-hr. blast furnace coke

at \$6; 72-hr. foundry \$7 and crushed coke from 1 in. size, \$7.35, all in net tons at oven.

The Carnegie Steel Co., Pittsburgh, expects to start part of its first unit of 640 Koppers byproduct coke ovens at Clairton, Pa., not later than July 1. The remainder will be put in operation shortly after. Work on the second unit of 640 ovens started some time ago, and also on 128 additional ovens placed recently, is going forward rapidly, but the latter ovens will not be making coke before late this year.

The Pittsburgh Steel Co. reports for the nine months ended March 31, 1918, sales of \$28,242,031, as compared with \$22,822,118 for the corresponding period of 1917. Net profits were \$3,891,204 after \$2,218,165 estimated war taxes were deducted, against \$7,160,422 net profits for 1917.

A meeting of stockholders of the New Castle Iron & Steel Co., New Castle, Pa., will be held in that city on Monday, July 22, for the purpose of voting for or against the proposed selling of the plant, assets and property to the American Rubber Products Co. In the event of this being favorably acted upon, a legal dissolution will likely be made of the New Castle Iron & Steel Co.

As customary, the June meeting of the Pittsburgh Foundrymen's Association this year will take the form of an outing, and will be held at the Westmoreland Country Club Monday, June 17. John A. Penton, Penton Publishing Co., Cleveland, is expected to make an address. The annual election of officers will also be held at this meeting.

In May the Carnegie Steel Co., Pittsburgh, turned out a total of 126,264 tons of plates in the mills at the Homestead Steel Works, the Liberty plate mill at Howard, and at the Upper and Lower Union mills, Pittsburgh. This is the largest output of plates the Carnegie Steel Co. ever made in any one month. The Liberty mill made 20,973 tons, against 18,025 tons made in April.

Chicago

CHICAGO, June 10.—(By Wire).

The new plan of regulation by the Government of iron and steel products as announced from Washington brought with it no surprise. Many believed it was coming and regard the move as for the best. More concern would be felt were the bulk of contracts not covered by priority certificates as they are, especially in steel. Contracts for pig iron likewise will not be much disturbed. Steel for the Government's freight cars is being placed, and how to get it out without conflict with Emergency Fleet Corporation requirements is a big question. To the 87,000 tons placed with the leading interest a week ago to-day was added 174,000 tons of plates, shapes and bars, while the leading independent to-day booked 30,000 tons of materials for the cars, and another independent mill with a new plant was allotted its portion. It is asked that deliveries begin this month, also that the Emergency Fleet material be not subjected to interference. The leading independent has also been asked to ship before July 31 about 9500 tons of plates, about half of the quantity named as its part of the quantity to be shipped to Japan in return for which the Japanese are to furnish ships. Meanwhile the bar-iron mills, which have idle capacity, have waited in vain for a demand for their product as a substitute for steel in the car building program. Considerable 1919 inquiry for pig iron is coming out, but it is receiving little attention. Spiegeleisen has been advanced from \$70 to \$75 furnace.

It remains true that more steel could be made by the leading interest if it were to receive more coking coal. The troubles lie in getting sufficient cars to transport the coal.

Ferroalloys.—Spiegeleisen, 16 to 18 per cent, has been advanced from \$70 to \$75, furnace. A fair amount of business was done prior to the advance. In 78 to 82 per cent ferromanganese, there have been a few trans-

actions at \$282 delivered. The quotation for standard 70 per cent is \$250 plus \$4 for each additional unit of manganese. For the so-called 80 per cent material a license is a requisite to its use.

Plates.—To the 87,000 tons of freight car material placed with the leading interest, reported a week ago, to-day was added 174,000 tons, making 264,000 tons placed with this producer, plates, shapes and bars being included, the largest percentage being in the first named. Deliveries are supposed to begin this month and it is stipulated that Emergency Fleet Corporation materials are not to be interfered with, but how this can be accomplished no one concerned can see. The leading independent to-day received 30,000 tons of material for Government cars, also 9500 tons of plates to be shipped to Japan before July 31, this quantity being about half of its allotment of the tonnage to be supplied to Japan in return for ships. The official mill quotation is 3.25c., Chicago or Pittsburgh, and jobbers quote 4.45c. for material out of warehouse. Priority certificates must be obtained in all cases.

Pig Iron.—The outstanding feature of the situation is the regulation of deliveries by the Government, the understanding being that shipments of surplus pig iron, or that which may not be needed for direct war work and essential industries, must have the written approval of the War Industries Board. To date sellers have not received official notification of the stricter regulations. What little business there has been has been limited to small lots of off iron or iron which for one reason or another does not fit in and is resold. A firm which recently offered some low-silicon and high-sulphur iron disposed of it very quickly, in fact, could have sold it several times over, a circumstance which is taken to indicate that melters want iron despite the well-stocked condition of some of them. Considerable inquiry for 1919 delivery is coming out, but the producers see no need to look that far ahead. One such inquiry is for 3000 tons of Southern iron wanted by a local consumer. An interesting phase of the situation is the extensive degree to which foundries have managed to cover their contracts for iron with priority certificates, their ability to do this eliminating the necessity of making many changes on producers' books.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5.....	\$37.50
Lake Superior charcoal, No. 6 and	
Scotch	39.00 to 40.50
Northern coke foundry, No. 1.....	33.50
Northern coke foundry, No. 2.....	33.00
Northern coke foundry, No. 3.....	32.50
Northern high-phosphorus foundry.....	33.00
Southern coke No. 1 foundry and No. 1 soft.....	38.50
Southern coke, No. 2 foundry.....	37.00
Malleable	33.50
Basic	32.00
Low phosphorus (copper free).....	53.00
Silvery, 7 per cent.....	54.54

Bars.—In view of the idle capacity of bar iron mills, it is a source of keen disappointment to the producers that they have not received orders for bar iron which unquestionably could be used to relieve the tension which exists in steel. Bar iron costs more than steel, but it is argued that full production counts for more than price. The lack of rerolling rails continues to restrict the production of high-carbon bars, but some of the mills manage to keep going with old rails and discard shell steel. A good deal of the latter is being used to make posts from which barbed wire entanglements are supported. Shell steel takes an extra of 5c. for carbon. We quote:

Jobbers' prices: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c.; base, with 5c. extra for twisting sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Mill prices are: Iron bars, 3.50c., Chicago; rail carbon, 3c., Chicago; mild steel bars, 2.90c., Chicago or Pittsburgh.

Structural Shapes.—A considerable tonnage of shapes is included in the car material orders already referred to. The building trade is dormant, but the fabricating shops have plenty to do on ship work. An unknown bidder will supply 210 tons of steel for the Mills Aviation Field, Sacramento, Cal. The mill quota-

tion is 3c., Chicago or Pittsburgh. Jobbers quote 4.25c. for material from warehouse.

Sheets.—The capacity of the leading independent is so taken up with Government requirements that it cannot consider orders for anything except light sheets and high-carbon bars, and it could sell far more sheets than it has available. Of course, in sheets priority certificates are required. Consumers of electrical sheets are having their troubles getting material, especially where the essential requirement is a bit hazy. We quote No. 28 black sheets at 5c.; No. 28 galvanized at 6.25c., and No. 10 blue annealed at 4.25c., all Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c., and No. 28 galvanized, 7.70c.

Wire Products.—The pressure for barbed wire is steadily growing worse, while for miscellaneous products there is a lively demand. The mills could be producing more were it not for a shortage of steel, part of which is due to insufficient coal and partly to the diversion of steel to other products. Wire product men are hoping that Government distribution will not affect them. We quote:

Nails, \$3.50, Pittsburgh; plain fence wire, \$3.25; painted barb wire, \$3.65; galvanized barb wire, \$4.35; polished staples, \$3.65, and galvanized staples, \$4.35.

Cast-Iron Pipe.—No new propositions or lettings are reported. The makers are having trouble in getting sufficient labor, despite the fact that some of their large plants are closed. Their activity is confined to general work and specialties, but it is hoped that the situation will be bettered by railroad buying.

Quotations per net ton Chicago are as follows: Water pipe, 4-in., \$63.35; 6-in. and larger, \$60.35, with \$1 extra for Class A water pipe and gas pipe.

Old Material.—There is a fair volume of business, but it is quietly conducted. The leading independent is buying melting steel and paying the full quoted price. Half a dozen railroads have lists before the trade, but all are small. A peculiarity of the times is that some of the roads are selling mixed scrap, not being able to spare the labor for its separation. If the local mills meet the market, it is not believed much steel will leave here for Eastern points.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails.....	\$38 to \$39.00
Relaying rails.....	60.00
Old carwheels.....	29.00
Old steel rails, rerolling.....	34.00
Old steel rails, less than 3 ft.....	34.00
Heavy melting steel.....	29.00
Frogs, switches and guards, cut apart.....	29.00
Shoveling steel.....	29.00
Steel axle turnings.....	22.00 to 23.00

Per Net Ton	
Iron angles and splice bars.....	\$34.82
Iron arch bars and transoms.....	\$40.50 to 41.50
Steel angle bars.....	29.00 to 30.00
Iron car axles.....	41.52
Steel car axles.....	41.52
No. 1 railroad wrought.....	29.75 to 30.36
No. 2 railroad wrought.....	27.50 to 28.00
Cut forge.....	27.50 to 28.00
Pipes and flues.....	23.50 to 24.00
No. 1 busheling.....	26.00 to 26.50
No. 2 busheling.....	17.50 to 18.00
Steel knuckles and couplers.....	30.36
Coil springs.....	30.36
No. 1 cast scrap.....	27.00 to 27.50
Boiler punchings.....	32.00 to 33.00
Locomotive tires, smooth.....	37.00 to 38.00
Machine-shop turnings.....	15.50 to 16.00
Cast borings.....	15.75 to 16.25
No. 1 cast scrap.....	27.00 to 27.50
Stove plate and light cast scrap.....	23.00 to 23.50
Grate bars.....	23.00 to 23.50
Brake shoes.....	23.50 to 24.00
Railroad malleable.....	29.50 to 30.00
Agricultural malleable.....	28.00 to 29.00
Country mixed scrap.....	20.00 to 20.50

Rails and Track Supplies.—No change is reported in an inactive market. The utilization of rail mills in the production of shell bars makes the situation serious. We quote:

Standard railroad spikes, 4.11½c., Chicago. Track bolts, with square nuts, 5.11½c., Chicago. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c.; f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill for 25 to 45-lb. sections, lighter sections taking Government extras.

Bolts and Nuts.—Consumers who long held back in placing their orders in the hope of getting lower prices are now running to get their requirements booked. Where oldtime relations have prevailed, their orders are being taken, but no promises are given as to the time of delivery or quantities. From now on, no difficulty in getting raw material promises to become acute, and a famine in bolts and nuts is thought not improbable. For prices and freight rates, see finished iron and steel f.o.b., Pittsburgh. Jobbers quote:

Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ¾ x 4 in., 40 and 10 per cent off; larger sizes, 35 and 5 off; carriage bolts up to ¾ x 6 in., 40 and 2½ off; larger sizes, 30 and 5 off; hot pressed nuts, square tapped, \$1.05 off, and hexagon tapped, 85c. off per 100 lb.; coach or lag screws, gimlet points, square heads, 50 per cent off.

Birmingham

BIRMINGHAM, ALA., JUNE 10.

Pig Iron.—With the falling off from 1917 production and the large movements of accumulated stocks, a famine in Southern pig iron almost may be said to be at hand. One concern reduced stocks by 10,000 tons, another by 7000 and others did as well during May. There can not be over 60,000 tons of free foundry on yards and the basic is preempted by makers for their own consumption. The Alabama May output with 32 active stacks, precisely the same as in May, 1917, fell off 50,000 tons, the figures being 210,600 this May and 261,000 in May, 1917. There was a decrease of 9000 tons in basic and 39,000 in foundry. It is all chargeable to labor. There is a shortage in numbers, but the greatest shortage is due to greenness and indisposition to put in full time. For instance, the largest independent coal operator reports 30 hours per week is the average of his miners in May. That is five hours per day. The smaller supply of coal means less coke and that means less pig iron. As an offset against the Alabama stack at Gadsden coming in, the Republic Iron & Steel Co. has blown out one at Thomas for relining. T. Hiraoka, representing the Uruga Dock Yard Co., Ltd., Tokio, says the Talladega, Ala., iron furnace, in which his Japanese principals are interested, will be in operation in July or August. The iron will go to Japan if the Government allows; otherwise it will go into domestic consumption. An order for 500 tons of special iron for Panama was accepted by the Alabama Co. and around 4000 to 5000 tons of gray forge on yards, for which \$32 flat was offered, has been accepted by another interest. As a rule, makers are running away from new business. No allocation has yet been made of the 180,000 tons of basic desired for the British, and it is now understood that it is to be placed throughout the country instead of in Alabama alone. Makers do not express a great diversion of pig iron for war purposes for the very simple reason that most of it is already going into that channel. Birmingham district plants are largely engaged in war work, making shells, ship propellers, marine engines and the like, while the wire output is largely for the Allies. Car service remains good in all fields. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

No. 2 foundry and soft.....	\$33.00
Basic.....	32.00

Cast-Iron Pipe.—Sanitary shops report only around 20 per cent of capacity in operation. Outside of the Corsicana, Tex., order for 3½ miles of 14-in. taken by the leading interest and others, there is very little new business outside of Government work.

Coal and Coke.—Neither coal nor coke production is keeping up satisfactorily. An average of five hours per day in coal mines on the part of coal diggers is not producing as much coal as at this time last year. The coke production suffers in consequence. A demand has arisen for the nut coke at by-product plants and it will move in quantities.

Old Material.—The scrap market is a see-saw affair, but there is little variation in the price list. This is owing largely to the absorption of stocks on hand by Southern consumers. Very little travels far afield. Demand and supply maintain a good parity. The price

basis is an independent one based upon what dealers get close at home, which is sometimes more than consumers who must stand a heavier freight rate are willing or able to pay. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel axles	\$34.00 to \$35.00
Old steel rails	28.00 to 28.50
Heavy melting steel	25.00 to 26.00
No. 1 railroad wrought	30.00 to 32.00
No. 1 cast	27.00 to 28.00
Old carwheels	29.00 to 29.50
Tramcar wheels	26.00 to 26.50
Machine shop turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Stove plate	23.00 to 23.50

St. Louis

ST. LOUIS, JUNE 10.

Pig Iron.—Representatives of furnaces are finding little to do except listen to the stories of the troubles of their customers, for they are unable to get anything to speak of in the way of material for their established trade and absolutely nothing for new customers of whom there is a constantly new influx into this market due to the hope that perhaps some tonnage is obtainable. A survey of the present situation indicates that from 50,000 to 60,000 tons of basic and 40,000 to 50,000 tons of foundry grades could be instantly disposed of, were it obtainable and in some cases there is very serious need of the iron. Foundries which have no Government business and which have more or less spurned it in the past are seeking Government contracts now as an open sesame to the pig iron supply and also as a means of keeping in operation, for with nothing available for domestic operation it behooves them to get Government business to keep their plants going.

Coke.—Nothing in the way of metallurgical coke is available in this territory so far as new business is concerned, and old customers report great difficulty in getting a sufficient supply for their needs. Oven representatives are without means of relieving the situation, which grows worse from week to week. The by-product output in this territory is fully tied up and no relief from that source can be expected. The approach of the period of contracting for the new year, July 1 to July 1, is being viewed with considerable apprehension by consumers, particularly those with a minimum of Government work on hand.

Finished Iron and Steel.—In finished products, the business moving is confined to peremptory needs, with no new construction considered by the sources of supply, while repairs and replacement works must have a good backing to get consideration. Warehouses are selling and delivering on this basis, on account of their supplies and also on account of the Government requirements. Representatives of the mills are doing no more than filing reports of the needs of their customers and leaving it to the developments of the future as to whether they will put those needs up to the mills, thus in effect establishing only a first-come, first-served list for the dim and distant future. For stock out of warehouse, we quote as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Old Material.—Conditions in the scrap market continue troublesome for the dealers who are making no new commitments beyond the date of the advance in freight rates and who are straining every nerve to get everything under contract shipped out before the advance takes place. In consequence, little attention is being paid to prices and quotations made are largely nominal, as there is little new business upon which to base figures. More than that, there is a shortage of scrap and very little is available for those who want it. The local industries, particularly those requiring steel scrap, will take all that can be obtained, while the rolling mill embargoes which have obtained are being slowly raised. There is a general feeling among the dealers that before very long the Government will

take over the control of the distribution of scrap and even go to the extent of superintending the award of scrap material offered on the railroad lists. The lists out during the week include 1600 tons from the Wabash, 1000 tons from the Missouri, Kansas & Texas, 800 tons from the Mobile and Ohio and 850 tons from the Union Pacific. Railroads are rather light in their offerings in part because of active reclamation and in part because of the shortage of labor which prevents picking up material otherwise available. Altogether there is very little to give real feature to the market. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$36.50 to \$37.00
Old steel rails, rerolling	33.50 to 34.00
Old steel rails, less than 3 ft.	31.00 to 31.50
Relaying rails, standard sections, sub-	
ject to inspection	60.00 to 65.00
Old carwheels	28.50 to 29.00
No. 1 railroad heavy melting steel	
scrap	28.00 to 28.50
Heavy shoveling steel	26.50 to 27.00
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards, cut apart	
Ordinary bundled sheet scrap	22.50 to 23.00
Heavy axle and tire turnings	20.50 to 21.00

Per Net Ton	
Iron angle bars	\$33.00 to \$33.50
Steel angle bars	27.00 to 27.50
Iron car axles	40.00 to 40.50
Steel car axles	40.00 to 40.50
Wrought arch bars and transoms ..	40.00 to 40.50
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	28.00 to 28.50
Railroad springs	28.50 to 29.00
Steel couplers and knuckles	29.50 to 30.00
Locomotive tires, 42 in. and over,	
smooth inside	36.00 to 36.50
No. 1 dealers' forge	26.00 to 26.50
Cast iron borings	15.00 to 15.50
No. 1 busheling	25.00 to 25.50
No. 1 boilers, cut to sheets and rings	
No. 1 railroad cast scrap	22.00 to 22.50
Stove plate and light cast scrap ..	25.50 to 26.00
Railroad malleable	20.00 to 20.50
Railroad malleable	26.00 to 26.50
Agricultural malleable	25.00 to 25.50
Pipes and flues	23.00 to 23.50
Heavy railroad sheet and tank scrap	
Railroad grate bars	22.50 to 23.00
Machine shop turnings	20.00 to 20.50
Country mixed scrap	15.50 to 16.00
Uncut railroad mixed scrap	19.00 to 19.50
	23.50 to 24.00

Buffalo

BUFFALO, June 10.

Pig Iron.—The Government's quota in the shipments of output going forward from furnaces is growing larger from day to day, and now covers 90 per cent, or over, of production for war needs on direct and indirect requisitions. Furnacemen recognize that Federal authority is to be more completely exercised in determining and prescribing the ultimate use of their product, and are ready to comply with consignment instructions. They are simply awaiting more explicit definition of the meaning and the details of the latest orders, which it is understood are to be issued by the Director of Steel Supply. Meantime they are sending in the names of customers, tonnages ordered and purposes for which the iron ordered is to be used, as fast as responses are received on the questionnaires recently sent out to all their customers. Replies have been received so far from about 75 per cent of the users to whom the questionnaires were issued, and the remainder, it is expected, will be turned in quickly. The answers received indicate that consumers' requirements are better covered than had been supposed, but notwithstanding this a large number of users are asking for further supplies, and many for considerable tonnages. No new business is being taken on, however. Price schedules remain the same as per recent reports, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon	\$34.50
No. 2 X, 2.25 to 2.75 silicon	33.50
No. 3 foundry, 1.75 to 2.25 silicon	32.50
Gray forge	32.00
Malleable	32.00
Basic	32.00
Lake Superior charcoal, regular grades, f.o.b.	
Buffalo	37.50

Finished Iron and Steel.—Large shipments of finished products are moving forward on direct war orders,

with smaller tonnages on indirect war orders, only odd-lot shipments being made on unclassified orders. It is expected that the war industries regulation for steel distribution will be placed in effect as rapidly as possible. From present indications there will be very little material shipped other than that on priorities or to customers who are included in the preference list drawn up by the Priorities Board. It is reported that jobbers' stocks of wire products are very low, some stocks being entirely exhausted of common sizes of nails. One producer of the district is shipping substantial tonnages of wire nails and barbed wire on Government orders. The demand for cold-rolled shafting is heavy, but none of the producers appears to have any open tonnage.

Old Material.—Demand continues strong for all classes of scrap, particularly for heavy melting steel and for scrap suitable for use in foundries, but dealers as a rule report very low stocks on hand and they are having difficulty in filling orders promptly. Mixed scrap from the country districts, which is usually received in good volume at this season of the year, is coming in only in small quantities, evidently having been gleaned earlier in the spring. Furthermore, scrap from the railroads, formerly the largest source of supply for dealers, is being sold direct to consumers without passing through dealers' hands. There is some talk of an endeavor being made to put into effect a zoning system throughout the country for the purpose of making a survey of stock now on hand and ascertaining the average tonnage of scrap production in each zone to determine just what quantities will be available for use next fall and winter, as it is felt there is a strong probability of a shortage of scrap next winter. There is also discussion among the trade of the desirability of the administration of scrap production in the iron and steel districts being taken over by the Government in order that proper distribution of the large tonnages of turnings and other scrap produced at munition plants may be made to users of scrap materials, as such materials are now practically as essential and requisite in the manufacture of steel as is pig iron. The price schedule is as follows, per gross ton, f.o.b., Buffalo:

Heavy melting steel	\$29.00
No. 1 low phosphorus, heavy, 0.04 and under ..	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, not guaranteed	34.00
No. 1 railroad wrought	34.00
No. 1 railroad and machinery cast	34.00
Iron axles	\$44.00 to 46.00
Steel axles	44.00 to 46.00
Carwheels	29.00
Railroad malleable	34.00
Machine shop turnings	17.00 to 17.50
Heavy axle turnings	24.00
Clean cast borings	18.00 to 19.00
Iron rails	36.00 to 37.00
Locomotive grate bars	24.50 to 25.00
Stove plate	24.50 to 25.00
Wrought pipe	27.00 to 28.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	21.00 to 23.00
Bundled sheet stamping scrap	21.00 to 23.00

Philadelphia

PHILADELPHIA, June 11.

The resolution adopted by the War Industries Board and the American Iron and Steel Institute that all pig iron and steel products shall be shipped hereafter only on priority certificates or to a preferential list of industries will make little, if any, difference, as steel plants have been for many weeks shipping all of their products as the Government directed. The pig iron trade has been following the same course, but in a more informal manner, priority certificates not yet having been issued on pig iron to producers or their agents here. Sensational newspaper reports that the steel trade has been "taken over" by the Government have no basis in fact. Only the output is taken over. The War Industries Board is now doing in a formal way what has been accomplished in an informal way since the 100 per cent pledge was adopted by the members of the American Iron and Steel Institute. It is true that the new order tightens the leaks and makes it impossible for consumers not on war work to obtain

any iron or steel without the written sanction of the War Industries Board, but this does not mean that there has been any radical departure from the methods which have been in effect since the Government, through J. Leonard Replogle, director of steel supply, made its wants so emphatically known to the steel trade at the meeting in Judge Gary's office in New York a number of weeks ago. The Government has allocated 200,000 forged steel car wheels, costing about \$8,000,000, to four companies.

Pig Iron.—The pig iron trade here is somewhat at sea in interpreting the resolution adopted by the War Industries Board and the American Iron and Steel Institute that no pig iron shall be shipped except on priority certificates or to a list of preferential industries. The pig iron producers have not as yet received priority orders. Instead of this, there has been frequent allocation of orders in the past few months for essential war industries by the Pig Iron, Ore and Lake Transportation Committee of the American Iron and Steel Institute. Pig iron distributors to-day were not all of one mind as to what they should do under the new order. Some thought they would continue to make shipments to essential industries, as they have been doing since the adoption of the 100 per cent pledge, while others believed that the resolution made it clear that they should wait for the Priorities Committee of the War Industries Board to send them priority certificates. One distributor said he would follow the latter course even though the furnace was obliged to pile iron while awaiting priority orders. It is unofficially reported in the trade that no foundry which is not doing at least 50 per cent Government work, direct or indirect, will obtain iron. That this may be the method of procedure is indicated by the announcement from the Fuel Administration that coal consumers will not receive coal unless they are at least 50 per cent on essential work. The distribution of foundry iron is the real difficulty in the iron trade. The situation as to steel-making iron is well taken care of through the fact that all steel plants are under control and their full output is known to be for the Government. Some of the foundries whose output is obviously of the less essential class will undoubtedly suffer a shortage of iron for a month or so, at least, or until it becomes definitely established whether there is going to be sufficient iron to take care of all consumers, those on Government work and those who are not. Some of the stove makers are using the last of their iron stocks and are unable to obtain more, and in at least one or two instances have applied to the Government for war orders. A number of stove plants have been converted to the manufacture of mortar bombs. Leonard Peckitt, president Empire Steel & Iron Co., has been appointed a sub-committee of the Pig Iron, Ore and Lake Transportation Committee of the American Iron and Steel Institute in charge of low phosphorus iron distribution. Mr. Peckitt has enlisted the co-operation of the low phosphorus iron makers and together they will work out a plan whereby the Government's requirements will be tabulated, and efforts will be made to increase production to meet these demands. We quote standard grades of iron f.o.b. furnace, except Virginia irons, for which delivered prices are quoted:

Eastern Pennsylvania No. 1 X	\$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X (including freight)	36.77
Virginia No. 2 foundry (including freight)	36.27
Basic	32.00
Gray forge	32.00
Bessemer	35.20
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—The coke situation is without change. The supply seems to be ample now for all purposes. We quote 48-hr. furnace coke at \$6 and 72-hr. foundry coke at \$7, f.o.b. Connellsville ovens.

Ferroalloys.—Importation of Brazilian manganese ores may be curtailed somewhat as a result of the activities of German submarines off the Atlantic Coast. Vessels bringing the ore from Brazil are reported to be exercising extreme caution, which necessarily makes the trip consume more time. There is not a large de-

mand for ferromanganese or spiegeleisen, but prices remain firm. Consumers coming into the market satisfy their wants quickly, and with less haggling over prices. Dealers report that there is less price-cutting now than at any time in months. Ferromanganese is quoted at \$250, f.o.b. maker's furnace, freight allowed, for 70 per cent, and spiegeleisen is quite generally on the basis of \$75 for the remainder of the year, f.o.b. furnace.

Billets—We quote open-hearth rerolling billets at \$50.50, Philadelphia.

Railroad Equipment—Orders for 200,000 forged steel wheels for 25,000 of the freight cars ordered by the Railroad Administration have been placed with four companies, the Carnegie Forged Steel Wheel Co., Pittsburgh, taking about one-third, the remainder being divided among the Standard Steel Works Co., Burnham, Pa., the Midvale Steel & Ordnance Co., Philadelphia, and the Edgewater Steel Co., Edgewater, Pa. Prices were fixed by agreement with the Railroad Administration at \$39 for the lighter wheels and \$41.50 for the heavier wheels per wheel, f.o.b. maker's works. Wheels for the other cars will be of cast iron.

Charcoal Iron Tubes—Makers of charcoal iron tubes are so short of orders that some of them may be forced to shut down their plants. The Railroad Administration recently bought seamless steel tubes for locomotives because of the latter being lower in price. As none but the Government is now buying locomotives, there is no business for the charcoal iron tube plants. The Government has been notified of the situation and unless orders are awarded, it is more than likely that some, or perhaps all, of these plants will suspend operations.

Structural Material—All of the shapes for the 100,000 cars contracted for by the Railroad Administration have been allocated. Specifications have been changed on the special 9-in. channels so that they can be rolled on standard mills. The first specifications provided for 68,000 9-in. flanged channels weighing 17 4/10 lb. each. No mill in this country was equipped to roll these and new rolls would have had to be provided. The situation was revealed to the Railroad Administration by steel makers and the specifications were changed to 9-in. standard channels of 17 1/2 lb. each. These shapes will be made of open-hearth steel, and in fact all parts of the cars subject to unusual stress must be open-hearth steel, but Bessemer steel will be used on parts not subject to great stress. This applies to plates as well as shapes. Charles M. Schwab, director general of the Emergency Fleet Corporation, has announced that two new fabricating shops will be built by the McClintic-Marshall Co., one at Pottstown, Pa., and the other at Pittsburgh. These two plants will cost about \$6,000,000 and will give 10,000 tons additional fabricated material a month to the Hog Island yard of the American International Shipbuilding Corporation. Mr. Schwab announced further that the American Bridge Co. would give the Emergency Fleet Corporation 20,000 tons more material than had been contracted for and two other companies have promised additional fabrication of 10,000 tons each. The Sun Shipbuilding Co., Chester, Pa., may double the size of its plant, in which event it will require about 8,000 to 10,000 tons of structural material for new shops and crane runways. Jobbers have been unsuccessful in their efforts to obtain about 1600 tons of shapes from an Eastern mill, this tonnage representing an accumulation of odds and ends from rollings during the past few months. The War Industries Board advised the steel company that the material should first be offered to industries coming within the preferential list embodied in the resolution of the board and the American Iron and Steel Institute. We quote shapes at 3c., Pittsburgh.

Plates—Fabricating shops, which are at work on material for the American International Shipbuilding Corporation, Hog Island, and the Submarine Boat Corporation, Port Newark, N. J., have become overloaded with plates, and orders have gone forth to one or two of the larger plate mills to cease shipments until fur-

ther notice. The fabricating shops will probably get caught up within a few weeks, when shipments will be resumed. Meanwhile, these mills are shipping their plates to other shipyards or to locomotive or car builders. The Railroad Administration is expected to place additional contracts soon with the American Locomotive Co. and the Baldwin Locomotive Works for locomotives. Large additional orders of plates for ships are soon to be allocated. We quote plates as 3.25c., Pittsburgh.

Old Material—While consumers of iron and steel scrap seem to be in a fairly easy position so far as supplies for current requirements are concerned, the scrap trade is somewhat anxious over the fact that consumers are not able to accumulate a surplus, as they usually do at this season of the year. Scrap dealers point out that unless such surplus stocks are piled up, there will surely be a serious shortage of scrap at many consuming points in the fall and winter. The American Board of Scrap Dealers is about to open a campaign for bringing hidden scrap to light, such, for example, as obsolete manufacturing plants and railroads. Report blanks will be furnished to all members by C. N. Barnes, secretary, Philadelphia, and when these reports have been returned properly filled out efforts will be made to induce the War Industries Board to condemn such scrap for the good of the country. Many schemes have been proposed to the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute to bring about a more widespread collection of scrap. One plan, which the committee has considered, is a scrap-collection week with a slogan such as "scrap will win the war." This campaign would be carried to the people in their homes and on the farms. It is not the disposition of the committee to adopt such a plan, however, except in an extreme emergency. The sub-committee will meet soon to consider price recommendations for third quarter. It is doubted that there will be any changes in base prices, but some members of the committee are disposed to recommend changes in some of the differentials and slight changes in phraseology to make the regulations more "watertight." Cast iron scrap for foundries may be reduced so that it will be in line with the price for foundry pig iron. We quote material for delivery at buyer's yard in eastern Pennsylvania as follows:

No. 1 heavy melting steel	\$29.00
Steel rails, rerolling	34.00
No. 1 low phosphorus heavy 0.04 and under ..	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus (not guaranteed) ..	\$33.00 to 34.00
Old iron rails	39.00
Old carwheels	29.00
No. 1 railroad wrought	34.00
No. 1 yard wrought	33.00
Country yard wrought	29.00
No. 1 forge fire	26.00 to 27.00
Bundled skeleton	26.00 to 27.00
No. 1 busheling	31.00
No. 2 busheling	17.00 to 18.00
Turnings (for blast furnace use) ..	17.50 to 18.00
Machine shop turnings (for rolling mill use) ..	18.50 to 19.00
Cast borings (for blast furnace use) ..	17.50 to 18.00
Cast borings (clean)	19.00
No. 1 cast (for steel plant use)	29.00
No. 1 cast (cupola sizes)	33.00 to 34.00
Grate bars	24.00
Stove plate	24.00 to 25.00
Railroad malleable (for steel plants) ..	28.00 to 29.00
Railroad malleable (for malleable works) ..	31.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications) ..	33.00
Ungraded pipe	29.00

Sheets—There are no new developments in the sheet situation affecting this market aside from the tighter restrictions on shipments imposed by the War Industries Board, as elsewhere referred to. We quote No. 10 blue annealed sheets at 4.25c.; No. 28 black sheets at 5c. and No. 28 galvanized sheets at 6.25c.

Iron and Steel Bars—Makers of bar iron are not included in the resolution adopted by the War Industries Board and the American Iron and Steel Institute controlling shipments. Apparently there is no reason for such supervision over iron products, which are plentiful enough for all Government requirements. The mills are having extreme difficulty in making shipments for other than Government work because of the neces-

sity of obtaining railroad permits. There is nothing new to report in the steel bar situation. We quote soft steel bars at 2.90c., Pittsburgh, and bar iron at 3.685c., Philadelphia.

British Steel Market

American Semi-Finished Steel Unobtainable—Markets Generally Active

(By Cable)

LONDON, ENGLAND, June 12.

General market conditions are active but fundamentally unchanged. American semi-finished steel is unobtainable. Tin plates are steady but quiet, with the maximum price at 32s. 3d basis. Ferromanganese is steady. We quote as follows:

Tin plate coke, 14 x 20; 112 sheets, 108 lbs., f.o.b. Wales, 32s. 3d.
Ferromanganese, \$260, c.i.f. for export to America; £26; 10s for British consumption.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices per gross ton are:
Hematite pig iron, East Coast, £6 2s 6d; West Coast, £6 7s 6d.
Cleveland pig iron, £4 15s for No. 3 and £6 for basic.
Steel plates, ship, bridge and tank, £11 10s.
Steel sheets, black plate, all open annealed, produced in sheet mills, £16 to £18.
Bar iron, standard quality, £13 17s 6d; marked, £16.
Sheet and tin plate bars, £10 7s 6d.
Blooms and billets for rerolling (ordinary), £10 7s 6d; special quality, £11.

Subsidy Proposed for Semi-Finished Steel Producers—Tin Plate Easier—Maximum Prices

(By Mail)

LONDON, ENGLAND, May 21.—The situation continues as satisfactory as could be expected considering the difficulties confronting the industry. The labor problem is becoming more complex and difficulty is experienced in keeping plants going at full capacity. On the other hand, means of transport have improved because of the efforts to protect the supply of rolling material. The freer movement of pig-iron supplies promises to be maintained.

Midland ironmasters are booking orders sparingly, being rather oversold, and the demand for steelmaking brands on the West Coast continues to exceed the supply, although every endeavor is being made to develop additional furnace capacity. As regards Cleveland foundry iron, consumers under the present system of distribution take good care to contract for their month's supply as soon as the allocations are out, and business can be arranged. The May allocations of foundry iron were exceptionally heavy and the great bulk of the business was carried through in the first half of the month, so that new business has been chiefly confined to forge iron which is not subject to similar allocations. A good surplus of foundry iron is held by makers and French needs are met as far as shipping facilities permit. A big tonnage is under license for Italy, but shipment is delayed by lack of freight room. The current output of East Coast hematite is absorbed quickly, chiefly by home users.

It is understood that a subsidy to producers of semi-finished steel has been arranged, so that the official price of Welsh bars and billets should remain undisturbed at £10 7s. 6d. net f.o.t. American material is a dead letter in the absence of offers.

Demand for finished iron and steel seems greater than ever and practically the whole of the output is absorbed by national needs. Possibly the pressure of requisitions for munitions is not quite so intense as it has been, but in any case this would be counterbalanced fully by the big deliveries of shipbuilding material. Control has been extended to re-rolled steel, the fixed price of which is £15 net at works. Iron and steel hoops will probably follow suit and the whole of the output of finished material looks like being put under market control.

Owing to the recent tension in tin the maximum basis of tin plates was at one period raised to 33s. 6d. with tin touching £380 per ton. This tended to elim-

inate practically all offers at a discount, but the tendency in the course of last week eased appreciably, chiefly in sympathy with the sharp break in tin. The maximum basis has dropped automatically to 33s. net. Trading has remained colorless, while French needs are covered well into next month. A fairly good order was placed recently for oilplates for the Eastern trade, but the general demand is listless, and orders can be placed with some makers at a small discount, although there is no pressure to sell. The tin deliveries are more regular and the output is satisfactory, while good shipments are being made to France.

Business in ferromanganese has been limited, and only a few small orders have been booked for Canada and the United States at \$255 to \$260 c.i.f. Atlantic ports. The tone is firm.

The most recent maximum prices for the British domestic trade in leading products is as follows:

British Iron and Steel Home Trade Maximum Rates

	£	s	d
Pig iron: Hematite, East Coast, mixed numbers.....	6	2	6
Hematite, West Coast, mixed numbers.....	6	7	6
Cleveland—No. 1.....	4	19	0
Cleveland, other grades.....	4	15	0
Cleveland, basic.....	6	0	0
Scottish foundry and forge—Nos. 3, 4 and lower grades of Monkland, Dalmellington, Eglinton and Govan.....	5	14	0
Nos. 3, 4 and lower grades of all other brands.....	5	15	6
Steel: Ship, bridge and tank plates ¼ in. (basis).....	11	10	0
Ship, bridge and tank plates under ¼ in. down to and including 3/16 in.....	14	10	0
Ship, bridge and tank plates under 3/16 in. down to and including ¼ in.....	16	0	0
Ship, bridge and tank plates under ¼ in. down to and including 3/32 in.....	17	0	0
S. M. boiler plates (basis).....	12	10	0
Angles and bulbs.....	11	2	6
Rounds, squares and hexagons			
Bars, 3 to 5½ in. (without tests).....	12	10	0
Bars, 3 to 5½ in. (with tests).....	13	0	0
Small rounds, squares and hexagons (without tests).....	15	0	0
to 15 10 0			
Joists.....	11	2	6
Rails, 60 lb. per yd. and over.....	10	17	6
Sheet and tinplate bars.....	10	7	6
Blooms and billets for re-rolling (ordinary).....	10	7	6
Blooms and billets for re-rolling (special).....	11	0	0
Bar iron: Standard quality, ordinary sizes (basis).....	13	17	6
Marked bars (basis).....	16	0	0
All prices net f.o.t. makers' works.			
Tool steel (delivered buyers' works):			
High-speed bars, 14 per cent tungsten.....	3s.	8d.	per lb.
High-speed bars, 18 per cent tungsten.....	4s.	5d.	per lb.

New York

NEW YORK, June 11.

Pig Iron.—The new policy of the War Industries Board in regard to pig iron has been the one topic of discussion during the past few days. Owing to the absence of leading officials of the American Iron and Steel Institute on a trip to Duluth, producers and sellers of pig iron have been unable to have certain parts of the resolutions of the board construed and doubt is entertained as to exactly what the policy is to be. The furnaces and their agents, in the absence of positive instructions from Washington, are continuing to ship iron in just the same way as they have been. The policy of following every request from Washington has been adhered to for some time and will be, but shipments are being made without specific priority orders. On the whole, the new arrangement is not regarded as a radical departure, but rather as a working out of plans which have been in course of formation at Washington. Every effort has been made to have dilatory consumers send in the questionnaire with the desired information as to their requirements and nearly all have responded. We quote as follows for tidewater delivery:

No. 1 X.....	\$35.25
No. 2 X.....	34.25
No. 2 plain.....	33.75
No. 1 Southern.....	\$39.75 to 40.25
No. 2 Southern (rail and water).....	39.00 to 39.25
No. 2 Southern (all rail).....	39.00 to 39.65
No. 2 X Virginia.....	37.02

Ferroalloys.—An indication that the campaign of education looking to the use of lower percentage manganese alloys is having its effect is the fact that there have been inquiries and sales of fair amounts of 30 to 40 per cent alloys in the last week. One consumer has bought 500 tons for delivery this year and another, who originally inquired for about 1000 to 1200 tons of 16 to

18 per cent spiegeleisen, has changed its inquiry to 1000 and perhaps 2000 tons of 30 to 40 per cent alloy. The quotation for such material is about \$3.90 to \$4 per unit, delivered. It is understood that one Middle Western producer of manganese alloys is able to use Lake Superior manganiferous iron ores in conjunction with other ores and produce a 30 to 40 per cent alloy at a satisfactory profit. The ferromanganese market is quiet but strong at \$250, delivered, for 70 per cent, plus \$4 per unit above this, with sales of only carload and small lots reported. Representatives of British producers have been advised that British licenses have been granted for the shipment of 1067 tons of 80 per cent ferromanganese to the United States. One firm has sold 500 tons to two American consumers, subject to whatever restrictions are in force. Another representative of a British producer is advised that his allotment of the 12,000 tons permitted to be imported has been licensed to be sent from England. The spiegeleisen market is quite strong and is now higher at \$75, furnace, for 16 to 18 per cent, plus \$3.50 per unit above this standard for any delivery this year. Ferrosilicon, 50 per cent, is quiet at about \$150 per ton, delivered, on contract and up to \$165 per ton asked for spot and prompt. Some other ferroalloys, in which there are few market changes from week to week, are quoted in this paragraph in the first week of each month.

Finished Iron and Steel.—Sellers are disposed to view with favor the latest agreement between the War Industries Board and the American Iron and Steel Institute's steel and steel products committee, in that it relieves them of all obligation in their refusal to accept business without priority certificates. So far as the consumer of indirect war and non-war material is concerned, he is beginning to believe his chief opportunity will come from his ability to accommodate his requirements to the small stocks likely to accumulate at mills; in other words, it is expected, as in normal times, such will be the conditions of rolling that such material as bars, rails and even structural steel will be available from time to time. The belief in some quarters is that the close control which the War Industries Board now holds on the manufacturers of iron and steel is the result of some departures from the 100 per cent pledge recently given—at least in spirit if not in letter. Now not merely the Government order number nor an affidavit in that regard will suffice, but instead an actual priority certificate is essential. That supplies for shipbuilding are accumulating is instanced from two or three recent cases where a suspension of shipment to fabricators well stocked was agreed to, partly to shift other supplies to shops not so well fixed. War building work and further railroad bridge building are naturally practically the only items of interest in the structural field. Double tracking of a Virginian Railway bridge will take 1800 tons, two highway bridges at Providence for the New Haven, 1300 tons. The Pennsylvania Railroad is in the market for two more bridges, requiring 350 tons, and the McClintic-Marshall Co. will supply 750 tons for three bridges for that road. Three buildings for the Midvale Steel & Ordnance Co. at Nicetown, Pa., will take 4000 tons and the bidders are not required to use material rolled by the Cambria Steel Co. The Bartlett-Hayward Co. requires a 700-ton building at Baltimore, and the American Bridge Co. will supply a 200-ton building at Waterbury for the American Brass Co. Distribution of 200,000 forged steel wheels for the heavier cars bought by the Railroad Administration have been distributed, as have the remainder of the 800,000 wheels, which will be cast wheels, some made by the car builders themselves. We quote: Steel bars, 3.095c.; shapes, 3.195c.; plates, 3.445c., and bar iron, 3.695c., all at New York. Out-of-store prices are 1c. higher.

Cast-Iron Pipe.—Cast-iron pipe manufacturers find little consolation in the resolutions adopted by the War Industries Board in regard to the distribution of iron and steel products. Cast-iron pipe is not put on a preferential list, as had been hoped, but manufacturers believe that they will be allowed to receive pig iron for use in making pipe and fittings for Government work, which is to-day a large part of their business. Govern-

ment prices are as follows: \$61.35, New York, for 6-in. and heavier and \$64.35 for 4-in.; \$71.35 for 3-in., with \$1 additional for Class A and gas pipe.

Old Material.—Mills in eastern Pennsylvania seem to be well supplied with scrap and very little is being sold for delivery in that section. Mills in the Pittsburgh district would be glad to receive larger tonnages, but owing to railroad congestion dealers are finding it very difficult to make shipments. It is understood that under the new railroad rates, effective June 25, the freight to Pittsburgh from New York will be \$4, not including the war tax, and \$2.76 to eastern Pennsylvania. We quote prices of brokers to New York producers and dealers as follows per gross ton, New York:

Per Gross Ton	
Heavy melting steel	\$26.00 to \$26.50
Rerolling rails	31.50
Relaying rails	60.00 to 70.00
Iron and steel car axles	44.00 to 44.30
No. 1 railroad wrought	31.50 to 31.80
No. 1 railroad wrought cut to not less than 10 in. or over 24 in.	36.50
Wrought-iron track scrap	29.50
Forge fire	23.50 to 24.00
No. 1 yard wrought long	30.50
Light iron	10.00 to 11.00
Cast borings (clean)	16.00 to 16.50
Machine-shop turnings	16.00 to 16.50
Mixed borings and turnings	15.50 to 16.00
Iron and steel pipe (1-in. minimum diameter), not under 2 ft. long.	30.00 to 30.50
Stove plate	22.50 to 23.00
Locomotive grate bars	22.00 to 22.50
Malleable cast (railroad)	31.00 to 31.50
Old carwheels	26.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	\$34.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	34.00
No. 1 heavy cast, not cupola size	29.00
No. 1 cast (radiators, cast boilers, etc.)	\$27.00 to 28.00

Cincinnati

CINCINNATI, June 11.—(By Wire).

Pig Iron.—A small percentage of foundry iron melters have been slow in returning their questionnaires. An estimate is made that about 10 per cent are delinquent in this respect and will probably be placed in the class of non-essential industries. Numerous messages have been received from the furnaces asking for information as to forwarding iron on contracts previously made when priority order numbers are not available. No decision so far has been given out on this question and it is believed that the matter will be left to the furnace operators at least for the time being. The furnaces are doing everything possible to co-operate with the Government in the distribution of iron. However, the opinion is generally expressed that if the distribution of pig iron is carried out as planned, it will cause considerable trouble for the reason that the furnaces are not always able to make the grade of metal wanted. Any casts of off iron would have to be piled with an extra expense until priority orders could be obtained for shipment to melters who could use the iron. Inquiries are light and sales have been limited in the past week to a few car lots of high-sulphur iron that were offered in the South.

Based on freight rates of \$2.90 from Birmingham and \$1.26 Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 2 foundry and No. 2 soft ..	\$35.90
Southern Ohio, No. 2	34.26
Basic, Northern	33.26

Coke.—The labor situation is very unsatisfactory in the different producing districts. A representative of a local firm recently made a tour of the Connellsville district and found a universal complaint made as to the unreliability of labor. Many workmen are making more money than at any time heretofore and the unfortunate tendency is to work a few days and then lay off on any pretext. So far the hot weather cannot have contributed very much to the inconvenience of workmen, as only a few days of high temperature have been recorded. If the present attitude of labor is kept up it is predicted that the real hot summer months will cut down production more than at any time heretofore. The

car supply is satisfactory, and if the labor situation should by chance show any improvement, there would be no complaint made as to shipments. No new contracting is in evidence, with the exception of a little foundry coke that is bought occasionally by consumers who find that their supply is apt to run short of requirements.

Finished Material.—It is no longer doubted that jobbers' stocks are running very low and there is no prospect that the situation can be relieved in time to take care of urgent orders that are daily coming in, most of which are unsolicited. The farmers are making urgent calls for wire fencing, but all orders are either taken subject to being able to get the material from the mills, or, are refused. There is practically no barbed wire in stock here with the exception of that in the hands of the retail hardware merchants, and this amount is very small indeed and these stocks will practically be wiped out within the next 10 days. The same is also true, to a certain extent, so far as wire nails are concerned. Galvanized sheets cannot be obtained from the mills except for strictly Government work, and jobbers in this vicinity have none on hand to offer. A few local sheet metal contractors were fortunate enough to secure a sufficient quantity of sheets to carry them through the next few weeks on repair work entirely, as no large contracts are in sight nor could they be accepted unless the work was for plants having war business. Some reinforcing concrete rods have been sold lately for additions to plants operating on essential business and there is a demand for other structural material which cannot be filled because of the depleted stocks.

Jobbers' prices are as follows: Iron and steel bars, 4.08½c.; twisted bars, 4.36½c. base; structural shapes, 4.18½c.; plates, ¼-in. and heavier, 4.43½c.; No. 10 blue annealed sheets, 5.43½c.; cold rolled shafting, 10 per cent plus list. The mill price on No. 28 black sheets remains at 5.18½c., and on No. 28 galvanized, 6.43½c. The warehouse price on wire nails is now at \$4.20 per keg base.

Nonferrous Metal Scrap.—A little better demand for copper and brass scrap is reported and quotations are stronger. Light copper shows an advance of ½c. per pound. Block tin pipe is declining almost as fast as it advanced last month and one dealer's offer is only 70c. as against 95 to 97c. three weeks ago. Transactions are very light. Heavy copper is unchanged at 21c., although a desirable amount might bring a higher figure. Lead is firmer.

Old Material.—All prices are very much firmer due principally to the fact that there is a better demand for scrap and also to the shorter supply. One prominent dealer predicts that yard stocks will be close to the point of exhaustion before many months, unless the supply is augmented in some way. At the present time the railroads use every pound of material that they can and this naturally cuts off a large tonnage that would usually find its way into dealers' hands. Shipping difficulties have not yet been overcome, but the movement of scrap to the Pittsburgh district is freer than at any time since last summer. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap.....	\$21.00 to \$21.50
Old iron rails.....	33.50 to 34.00
Relaying rails, 50 lb. and up.....	44.50 to 45.00
Rerolling steel rails.....	32.00 to 32.50
Heavy melting steel scrap.....	27.00 to 27.50
Steel rails for melting.....	27.00 to 27.50
Old carwheels.....	28.50 to 29.00
Per Net Ton	
No. 1 railroad wrought.....	\$29.00 to \$29.50
Cast borings.....	13.00 to 13.50
Steel turnings.....	13.00 to 13.50
Railroad cast.....	25.00 to 25.50
No. 1 machinery.....	26.00 to 26.50
Burnt scrap.....	17.50 to 18.00
Iron axles.....	40.00 to 40.50
Locomotive tires (smooth inside).....	35.50 to 36.00
Pipes and flues.....	21.00 to 21.50
Malleable cast.....	24.50 to 25.00
Railroad tank and sheet.....	18.50 to 19.00

Luria Brothers & Co., Inc., Reading, Pa., has been incorporated with a capital of \$1,000,000 by Max Luria and associates to manufacture iron and steel products.

Cleveland

CLEVELAND, June 11.

Iron Ore.—Meetings that were attended by a number of representatives of Cleveland ore firms were held in Chicago to-day to take up the matter of making request upon the War Industries Board for an increased price on ore, which it is claimed has been made necessary by the 33.6c. per gross ton advance in freight rates on ore and by two wage increases this year aggregating 25 per cent. During the morning a meeting of the producers from the Lake Superior district and selling agents was held at the Auditorium Annex to discuss the situation and formulate plans, and in the afternoon producers and representatives of the ore firms held a meeting with the Steel and Steel Products Committee of the American Iron and Steel Institute at the office of E. J. Buffington, president Illinois Steel Co. The price question was first taken up at the meeting of representatives of the ore selling firms in Cleveland last week, and it was decided at that time that the ore producers should take a hand in the matter and present data regarding the cost of mine operations to be used in support of the contention that ore prices should be advanced. There has been some speculation as to why Director McAdoo in advancing ore rates stipulated that the entire advance should be on shipments from the mines to the upper Lake docks, throwing the entire increase on the seller instead of partly on the consumer. This, however, is explained by the fact that with the increased rate paid entirely before the ore reaches the vessels, no advantage is given to the Lake furnaces as compared with the interior furnaces, which would have resulted from a part of the extra rate being placed on the haul from the lower Lake docks to inland furnaces. In this connection, an important question has come up regarding ore on docks and in transit. The Government order stipulates that there shall be no increase in rates on ore that has paid one increased rail rate before reaching the shipping port. This is construed by ore men to mean that ore on docks and in transit when the new rate goes into effect June 24 and which has not paid the increased rail rates from the mines to the shipping ports must pay the increased rate when shipped from lower Lake docks to consuming furnaces. If this construction of the law is correct, this burden of increased rates on ore shipped from dock and that in transit June 24 will fall entirely upon the consumer, and this will apply to all dock ore, whether it was shipped this season or has been on docks for a year or more. We quote, f.o.b. lower Lake ports as follows:

Old range Bessemer, \$5.95; old range non-Bessemer, \$5.20; Mesaba Bessemer, \$5.70; Mesaba non-Bessemer, \$5.05.

Pig Iron.—The announcement by the War Industries Board to the iron and steel trade of its agreement with the American Iron and Steel Institute that the distribution of pig iron as well as steel will be controlled by the Government and iron furnished to consumers by priority certificates and to those in preference lists is expected to cause some confusion in shipping iron until the new regulations are in good working order. Since the pig iron producers made their pledge to supply 100 per cent of their output for the requirements of the Government, they have, as far as they have been able, shipped iron to consumers having Government work in preference to others having orders on their books but not engaged in war essential work. Under the new regulations it will be necessary for consumers doing Government work to secure priority certificates for their iron, and the requirements of other preferred consumers will be cared for after the iron covered by the priority certificates is furnished. Until they receive more definite information on the matter, local selling agents are following their recent policy of giving preference in shipments to those of their customers whom, they know, have Government orders. New inquiry for a large amount of pig iron for Government work reached the pig iron committee of the American Iron and Steel Institute for allocation during the week. These inquiries include from 12,000 to 15,000 tons of Bessemer iron, over 20,000 tons of basic

iron, 12,000 tons of low phosphorus iron, a round tonnage of foundry iron and some charcoal iron. Among the inquiries is one from a locomotive company for about 8,000 tons of foundry iron. Among allocations during the week were 14,000 tons of basic iron for a Monessen, Pa., steel maker, 1250 tons of foundry iron for a Detroit shipyard, 500 tons of foundry iron for a Baltimore plant, 200 tons of foundry iron for a New Jersey plant, 200 tons of foundry and malleable iron for a Milwaukee foundry, 400 tons of foundry iron for a Pittsburgh foundry and 2500 tons of basic iron for a New York condenser plant. Reports from the furnaces in reply to the questionnaire sent out to the pig iron consumers are now being received more rapidly by the committee, but only a small percentage of the reports have yet come in. Some of the furnace companies have followed with telegrams their letters to consumers asking for early replies, and these telegrams have brought quick response in many cases. We quote delivered Cleveland, as follows:

Bessemer	\$36.15
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	47.40
Standard low phosphorus, Valley furnace....	53.00

Bolts, Nuts and Rivets.—Bolt and nut specifications are very heavy, and some of the manufacturers are several weeks behind on priority shipments of some sizes. Orders are still being taken from commercial consumers, but deliveries on these orders are contingent on manufacturers' ability to make shipments after supplying the Government demands. The profits of bolt and nut manufacturers have been materially reduced by the advance in freight rates, as prices include delivery to points east of the Mississippi and north of the Ohio River. The higher freight rate adds \$2 or more a ton to the cost of delivery to some shipping points. The increased use of iron in place of steel for the manufacture of bolts and nuts is also adding materially to manufacturers' costs. Rivet specifications continue heavy, but no large new orders or inquiries are reported.

Old Material.—There is little new inquiry for scrap, but dealers say that mills will buy all the heavy melting steel that is offered. There is still a scarcity of this grade, but other grades of scrap are fairly plentiful. Most dealers still have round tonnages of unfilled orders on their books, and are shipping material as rapidly as possible in order to make deliveries before the advance in freight rates goes into effect. The possibility of a change in prices July 1 is now being discussed by dealers, but few expect that present prices will be changed. There is very little demand for cast scrap, and busheling is inactive, although one sale of several hundred tons of new busheling is reported to have been made to a Cleveland consumer at the Government price of \$31. This is higher than the usual quotation on yard busheling. We quote, delivered at consumers' yards in Cleveland and vicinity as follows:

Per Gross Ton	
Steel rails	\$27.00 to \$28.00
Steel rails, rerolling	34.00
Steel rails, under 3 ft.	34.50
Iron rails	39.00
Iron car axles	46.50
Steel car axles	46.50
Heavy melting steel	29.00
Cast borings	18.00 to 18.50
Iron and steel turnings and drillings. 18.00 to	18.25
No. 1 railroad wrought	34.00
Hydraulic compressed sheet scrap... 28.00 to	29.00
Cast-iron car wheels, unbroken	29.00
Cast-iron car wheels, broken	34.00
Agricultural malleable	24.00 to 25.00
Railroad malleable	34.00
Steel axle turnings	24.00
Light bundled sheet scrap	24.50 to 25.00
Cast-iron scrap	29.00
Cast-iron scrap, broken to cupola size. 31.00 to	31.50
No. 1 busheling	29.50 to 30.00
Per Net Ton	
Railroad grate bars	21.00 to 21.50
Stove plate	21.00 to 21.50

Coke.—There is a good demand from foundries for by-product coke for prompt shipment which is being

supplied by a Cleveland producer. The district fuel administrator in the Virginia coke district has asked sellers of Virginia coke to canvass their trade and advise what percentage of the product of these foundries is being used for war essential work. So far, a canvass of the consumers of Connellsville and by-product coke has not been requested.

Finished Iron and Steel.—The demand for steel from warehouses is heavy and stocks are rapidly dwindling. Jobbers are now taking orders only for material for war essential work. Little new inquiry reached the sales offices of the mills during the week. The new regulations giving the Government complete control of the distribution of steel and providing for the issuance of licenses for material for non-essential business are generally meeting with favor among the trade, but is not expected to effect much change in the present conditions except to make the governmental reins over the steel supply somewhat tighter. There appears to be little prospect that makers of non-essentials will be able to secure material except possibly where mills can occasionally roll small lots without interfering with war essentials. The Lima Locomotive Corporation is inquiring for steel for 50 locomotives ordered by the Government. A Cleveland mill expects to take considerable plate tonnage for freight cars, but its allocation has not yet been made. Implement makers are crowding the mills for deliveries, and some are suffering because of not getting material as needed. Sheets are in good demand in small lots and mills are now accepting orders only when accompanied by priority order numbers. Jobbers are unable to get shipments on sheets, and their stocks are very low. Light rails are in good demand from coal-mining companies, and orders are being taken without priority certificates. Bar iron is in good demand.

We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

IRON AND INDUSTRIAL STOCKS

General Market Tone Strong, but Week Shows No Definite Trend

NEW YORK, June 10.

While cognizance of military operations in Europe was not lacking in the past week's trading, the general tone was one of quiet and confidence and there was no evidence of liquidation. Quotations fluctuated without definite trend. Steel company stocks in nearly all cases showed slight increases over the previous week, but this advance was not maintained so uniformly among metal-working industrial shares.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com. 32 - 34½	Int. Har. Corp. com. 60½ - 62
Allis-Chalmers pf. 84¼ - 85	Lackaw. Steel .. 84¼ - 86½
Am. Can com. 44 - 45½	Lake Super. Corp. 15½ - 16½
Am. Can pf. 94½ - 96	Lima Loco. 47
Am. Car & Fdry. com. 79 - 80½	Midvale Steel .. 47¾ - 51½
Am. Car & Fdry. pf. 109½	Nat.-Acme 29¾ - 30
Am. Loco. com. 62½ - 65¼	Nat. Enam. & Stm. com. 50 - 51¼
Am. Loco. pf. 97	N. Y. Air Brake. 123¼ - 125
Am. Ship com. 125 - 129	Pressed Stl. com. 59¼ - 61½
Am. Ship pf. 90 - 92	Pressed Steel pf. 93
Am. Steel Fdries. 65¼ - 66	Ry. Steel Springs com. 53 - 54¼
Bald. Loco. com. 85¼ - 91¼	Ry. Steel Springs pf. 97
Beth. Steel com. 81¼	Republic com. .. 82¾ - 87¼
Beth. Stl. Cl. B. 79¾ - 83¾	Republic pf. 99 - 100
Cambria Steel .. 126 - 130	Sloss com. 65 - 66½
Central Fdry. pf. 37	Superior Steel .. 39½ - 40¼
Chic. Pneu. Tool. 66½ - 67¾	Transue-Williams 37½ - 39
Colo. Fuel 46¼ - 49¼	Un. Alloy Steel.. 39 - 40
Cruc. Steel com. 61¼ - 65¼	U. S. Pipe com. 14¼
Crucible Steel pf. 91½ - 91¾	U. S. Steel com. .. 97¼ - 101¼
Deere & Co. pf. 90	U. S. Steel pf. ... 109¼ - 110¾
Gen. Electric ... 142 - 148¾	Va. I. C. & Coke. 72½ - 73
Gt. No. Ore Cert. 31¼ - 33¼	Warwick 8 - 8½
Gulf States Steel. 84¼ - 86	Westingh. Elec. .. 41¾ - 43
Int. Har. of N. J. com. 126½ - 127¾	

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 13.5c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 40c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, \$1.00; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.05, minimum carload, 40,000 lb.; and \$1.00, minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 40c., minimum carload 46,000 lb.; to St. Paul, 35.5c., minimum carload 46,000 lb.; Denver, 79c., minimum carload 46,000 lb. A 3 per cent transportation tax now applies. On iron and steel items not noted above, rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees, structural sizes, 3c.

Wire Products

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.25; galvanized wire, \$3.95; galvanized barbed wire and fence staples, \$4.35; painted barbed wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets, \$4.40 base
Large boiler rivets, \$4.50 base
7/16 in. x 6 in. smaller and shorter rivets, 50-10 per cent off list
Machine bolts h.p. nuts, 1/2 in. x 4 in., 50-10 per cent off list
Smaller and shorter, rolled threads, 50-5 per cent off list
Cut threads, 50-5 per cent off list
Larger and longer sizes, 40-10 per cent off list
Machine bolts c.p.c. and t. nuts, 1/2 in. x 4 in., 50-10 per cent off list
Smaller and shorter, 40-10 per cent off list
Larger and longer, 35-5 per cent off list
Carriage bolts, 1/2 in. x 5 in., 50-5 per cent off list
Smaller and shorter, rolled threads, 40-10 per cent off list
Cut threads, 40-10 per cent off list
Larger and longer sizes, 40 per cent off list
Lag bolts, 50-10 per cent off list
Flow bolts, Nos. 1, 2, 3, 50 per cent off list
Hot pressed nuts, sq., blank, 2.50c. per lb. off list
Hot pressed nuts, hex., blank, 2.30c. per lb. off list
Hot pressed nuts, sq., tapped, 2.30c. per lb. off list
Hot pressed nuts, hex., tapped, 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank, 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped, 2.00c. per lb. off list
Semi-finished hex. nuts:
1/2 in. and larger, 60-10-10 per cent off list
9/16 in. and smaller, 70-5 per cent off list
Stove bolts, 70-10 per cent off list
Stove bolts, 2 1/2 per cent extra for bulk
Tire bolts, 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$57; chain rods, \$65; screw, rivet and bolt rods and other rods of that character, \$65. Prices on high carbon rods are irregular. They range from \$70 to \$80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4 1/4 in. and heavier, per 100 lb., \$3.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$4.90. Boat spikes, \$5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective May 21 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., \$15 per package; 8-lb. coating, I. C., \$15.30; 12-lb. coating, I. C., \$17.00; 15-lb. coating, I. C., \$18.00; 20-lb. coating, I. C., \$19.60; 25-lb. coating, I. C., \$20.60; 30-lb. coating, I. C., \$21.75; 35-lb. coating, I. C., \$22.75; 40-lb. coating, I. C., \$24.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Steel				Iron			
Inches	Black	Galv.		Inches	Black	Galv.	
1/2, 3/4 and 1	44	17 1/2		1/2 and 3/4	23		+4
1 1/2 to 3	48	33 1/2		3/4	24		+3
	51	37 1/2		1/2 to 1 1/2	28		10
					33		17
Lap Weld				Lap Weld			
2	44	31 1/2		1 1/2	18		3
2 1/2 to 6	47	34 1/2		1 1/2	25		11
7 to 12	44	30 1/2		2	26		12
13 and 14	34 1/2			2 1/2 to 6	28		15
15	32			7 to 12	25		12
Butt Weld, extra strong, plain ends				Butt Weld, extra strong, plain ends			
1/2, 3/4 and 1	40	22 1/2		1/2, 3/4 and 1	22		5
1 1/2 to 1 1/2	45	32 1/2		1 1/2 to 1 1/2	27		14
2 to 3	49	36 1/2		2 to 3	33		18
	50	37 1/2					
Lap Weld, extra strong, plain ends				Lap Weld, extra strong, plain ends			
2	42	30 1/2		1 1/2	19		4
2 1/2 to 4	45	33 1/2		1 1/2	25		11
4 1/2 to 6	44	32 1/2		2	27		14
7 to 8	40	26 1/2		2 1/2 to 4	29		17
9 to 12	35	21 1/2		4 1/2 to 6	28		16
				7 to 8	20		8
				9 to 12	15		3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5 1/2 points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		Charcoal Iron	
3 1/2 to 4 1/2 in.	34	3 1/2 to 4 1/2 in.	12 1/2
2 1/2 to 3 1/2 in.	24	3 to 3 1/2 in.	+ 5
2 1/2 in.	17 1/2	2 1/2 to 2 3/4 in.	+ 7 1/2
1 1/2 to 2 in.	13	2 to 2 1/2 in.	+ 22 1/2
		1 1/2 to 1 3/4 in.	+ 35
Standard Commercial Seamless—Cold Drawn or Hot Rolled		Standard Commercial Seamless—Cold Drawn or Hot Rolled	
Per Net Ton		Per Net Ton	
1 in.	\$340	1 1/2 in.	\$220
1 1/2 in.	280	2 to 2 1/2 in.	190
1 3/4 in.	270	2 1/2 to 3 1/2 in.	180
1 1/2 in.	220	4 in.	200
		4 1/2 to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

Blue Annealed—Bessemer		Blue Annealed—Bessemer	
		Cents per lb.	
No. 8 and heavier			4.20
Nos. 9 and 10			4.25
Nos. 11 and 12			4.30
Nos. 13 and 14			4.35
Nos. 15 and 16			4.45
Box Annealed, One Pass Cold Rolled—Bessemer		Box Annealed, One Pass Cold Rolled—Bessemer	
		Cents per lb.	
Nos. 17 to 21			4.80
Nos. 22 and 24			4.85
Nos. 25 and 26			4.90
No. 27			4.95
No. 28			5.00
No. 29			5.10
No. 30			5.20
Galvanized Black Sheet Gage—Bessemer		Galvanized Black Sheet Gage—Bessemer	
		Cents per lb.	
Nos. 10 and 11			5.25
Nos. 12 and 14			5.35
Nos. 15 and 16			5.50
Nos. 17 to 21			5.65
Nos. 22 and 24			5.80
Nos. 25 and 26			5.95
No. 27			6.10
No. 28			6.25
No. 29			6.50
No. 30			6.75
Tin-Mill Black Plate—Bessemer		Tin-Mill Black Plate—Bessemer	
		Cents per lb.	
Nos. 15 and 16			4.80
Nos. 17 to 21			4.85
Nos. 22 to 24			4.90
Nos. 25 and 27			4.95
No. 28			5.00
No. 29			5.05
No. 30			5.05
Nos. 30 1/2 and 31			5.10

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery								
Copper, New York			Tin,		Lead		Spelter	
	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis	
June 5	23.50	23.50	90.00*	7.25	7.12½	7.50	7.25	
6	23.50	23.50	90.00*	7.25	7.12½	7.50	7.25	
7	23.50	23.50	90.00*	7.25	7.12½	7.50	7.25	
8	23.50	23.50	90.00*	7.25	7.12½	7.62½	7.37½	
10	23.50	23.50	90.00*	7.25	7.12½	7.62½	7.37½	
11	23.50	23.50	90.00*	7.25	7.12½	7.62½	7.37½	

*Nominal.

NEW YORK, June 12.

Two of the markets show pronounced strength but the rest are quiet. None are particularly active. Copper conditions are apparently unchanged. The easing in tin continues but business done is of small volume. Lead is higher and in more active demand. Spelter has advanced on light transactions, due to few offerings. Antimony sales have been larger and the market is higher.

New York

Copper.—An interesting rumor in the market is to the effect that the Government is to permit 15 per cent of the output of copper to be sold at whatever price it will bring. If this should be so, it is expected that it would sell at as high as 35c. per lb. and thus increase present returns at least 1¼c. per lb. over the present fixed price of 23.50c. and at the same time save the output of the small producers who now assert that they cannot operate at a profit. Another meeting of producers is scheduled for Aug. 7. May output of copper from smelters thus far received makes a favorable comparison with March and is higher than the April output. Copper demand is very large, and producers are considerably behind in deliveries due June 1. Prof. L. C. Groton has been appointed secretary of the Copper Producers' Committee.

Tin.—Late last week, Thursday and Friday, a little business was done in future shipment from the Far East, but the quantity was not large. The sales were made at prices running down to 82c. per lb. So far this week transactions have been practically nothing. The fact that the Eastern price fell £23 per ton between last Saturday and Monday of this week has unsettled the market, so that buyers are not interested and are waiting developments. The spot market is unchanged and nominal at 90c. per lb. New York. Deliveries of tin from the Pacific Coast in May are reported to have been 3210 tons, which with the 846 tons at Atlantic ports makes the total May deliveries 4056 tons. The average per month to June 1 have been 4459 tons, which compares with 3475 tons per month in the first seven months of 1914. Arrivals to June 1 at Atlantic ports have been 75 tons, with 800 tons reported at Pacific ports on June 5. The London market is again lower at £329 per ton for spot Straits yesterday, or £17 per ton less than a week ago.

Lead.—On Wednesday, June 5, announcement was made that the American Smelting & Refining Co. had raised its price ¼c. per lb. to 7.25c., New York. This had been expected in view of the strength of the outside market. It is stated that that interest sold a little lead at that time, but that it has now withdrawn from the market. The feature of interest is the fact that the Government has stepped in in the last week and made large purchases, cleaning up nearly all of the available supply, so that prompt lead is harder than ever to obtain. A few outside producers still have some lead to sell but are not pushing it in order to serve the Government's possible demand first. It is understood that some lead was sold just prior to the Government's purchasing at ¼c. per lb. above the Trust price. The market is quoted as nominal at 7.25c., New York, or

7.12½c., St. Louis, for early delivery. As high as 7.25c., St. Louis, was bid yesterday for nearby lead.

Spelter.—The market continues to strengthen and yesterday prime Western for early delivery was quoted at from 7.37½c. to 7.45c., St. Louis, or 7.62½c. to 7.70c., New York. Sales have been made at 7.37½c. to 7.40c., St. Louis, for early delivery. For third quarter 7.50c., St. Louis, or 7.75c., New York, is asked. The inclination on the part of several large producers not to offer much spelter for any delivery largely explains the stronger market. Sales as a whole have been light and demand is not large. There has been some buying by dealers.

Antimony.—The market has been quite active in the past week with estimated sales at least 1000 tons. Quotations are higher at 12.75c. to 13c. per lb., duty paid, for prompt and early delivery.

Aluminum.—Government maximum prices control the market for No. 1 virgin metal, 98 to 99 per cent pure, and for scrap aluminum at 33c. per lb. in 50-ton lots, 33.10c. per lb. for 15 to 50 tons and 33.20 for 1 to 14 tons. They are effective until September 1.

Old Metals.—The market is quiet and trading is light. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	23.50
Copper, heavy and wire	23.50
Copper, light and bottoms	21.00 to 21.50
Brass, heavy	16.00 to 16.50
Brass, light	12.00 to 12.25
Heavy machine composition	24.50 to 25.00
No. 1 yellow rod brass turnings	13.00 to 13.50
No. 1 red brass or composition turnings	20.30 to 21.00
Lead, heavy	6.50 to 6.75
Lead, tea	5.50
Zinc	5.75

Chicago

JUNE 11.—More tin is coming in on old contracts, but spot delivery is as tight as ever, with practically none to be had. Copper deliveries are not so liberal. It is reported that producers are still hoping for an advance in price. Inquiries for lead have been heavy and some large sales have been made, with the result that the price is higher and one or two producers have withdrawn from the market. The large consumption of lead by the Government is an important factor. Spelter is quiet. Antimony shows more activity than a few weeks ago. We quote copper at 23.50c. for carloads and 24.67½c. less than carloads; tin, 95c. to \$1; lead, 7.50c. to 7.65c.; spelter, 7.45c. to 7.50c.; antimony, 14c. to 15c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 21c.; copper bottoms, 19c.; red brass, 21c.; yellow brass, 14c.; lead pipe, 5.50c.; zinc, 5c.; pewter, No. 1, 55c.; tinfoil, 65c.; block tin, 70c.

St. Louis

JUNE 10.—The market has been stronger with the closing price to-day for lead in carload lots at 7.35c. for chemical and 7.30c. for soft Missouri; spelter, firm, with little offering at 7.37½c. to 7.50c.; less than carloads: Lead, 8.25c.; spelter, 8.50c.; tin, \$1.25, nominal; copper, 25.12½c.; Asiatic antimony, 15c. In the Joplin district zinc ore was easy, but without any drop in price and an expectation of a firmer market because of the strength in spelter. Top grades ore are quoted at \$75 per ton, basis 60 per cent., while second grades are a little better in tone, reaching \$60, with the weekly average at \$49, owing to the heavy sales of low grade ore. Only about 1300 tons of high grade ore was sold. Production is increasing under the higher price for top grade ores and buyers are no longer uneasy as to supplies. Calamine was steady at \$25 to \$34 per ton, basis 40 per cent. with the weekly average \$33. Lead ore was firm at \$85 per ton, basis 80 per cent averaging \$84 for the week. On miscellaneous scrap metals we quote dealers' buying prices as follows: Zinc, 5c.; lead, 5.50c.; tea lead, 5c.; light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; pewter, 30c.; tinfoil, 60c.

CONSERVATION OF PIG TIN

The Limitation of New Tin Plate Orders to Food Containers

WASHINGTON, June 11.—Conservation plans respecting tin plate and pig tin are being hastened by the War Industries Board, with a view to saving the situation for the current year before it is too late, and also for the purpose of informing consumers at the earliest possible moment of what they must expect in the way of prohibitions or restrictions during the war. As a result of conferences between officials of the board and members of the tin plate manufacturers' committee headed by J. I. Andrews of Pittsburgh, held here during the past week, it has been practically determined to maintain in force until September the agreement recently reached with the tin plate mills to book no further orders for plate for the manufacture of containers for other than food purposes. This arrangement, it is believed, will insure an adequate supply of tin plate for the production of food cans, and will carry the country safely through the 1918 canning season. At the same time it will obviate the hardships that would have been imposed upon many users of cans for other than food purposes had the War Industries Board adopted the proposed drastic order forbidding the manufacture of containers for other than food purposes.

- As to Containers Other Than for Food

The attention of the officials here has been drawn to the fact that certain can manufacturers are advising their customers that tin plate can hereafter be used only for making food containers, and are thus causing much anxiety among producers of many lines of goods commonly packed in tin. The correspondent of THE IRON AGE is able to state on the highest authority that there is absolutely no truth in these statements; in fact, it is among the possibilities that the supply of tin containers for other than food purposes will be sufficient to meet the needs of all consumers providing no attempt is made to load up with stocks of either containers or packed products. The tin plate mills are making regular deliveries of plate ordered prior to the date of the recent agreement, and will continue to do so until all such orders have been filled. The principal can manufacturing companies are understood to have on hand very considerable quantities of tin plate, the great bulk of which they will now be able to utilize in the manufacture of non-food containers, as they will be able to procure supplies of plate for food cans from the mills and to obtain the necessary priority orders to move such plate with the utmost promptness. Inasmuch as the agreement between the War Industries Board and the plate manufacturers will expire in September, and will probably not be renewed until some time in the summer of 1919, the outlook for a reasonable supply of cans for other than food purposes is certainly far from discouraging.

Erroneous Reports

The recently promulgated agreement with the tin plate manufacturers has produced an astonishing crop of erroneous reports, including the circumstantial statement that manufacturers of products other than food will not be permitted hereafter to use even such stocks of tin containers as they have on hand in putting up their goods. This report is entirely baseless, but has caused much apprehension. Obviously, the Government would have no object in restricting the use of cans already manufactured, but this point is met in some versions of this report, which state that it is the purpose of the War Industries Board to put all manufacturers on an equality by immediately prohibiting the use of tin as containers for other than food products. Paint manufacturers appear to have been especially disturbed over these reports for the reason that they have heretofore conferred with the conservation division of the War Industries Board and have reached an agreement under the terms of which they are observing certain economies calculated to effect a saving of not

less than 25 per cent. in the amount of plate consumed by the industry. It is stated here that the agreement with the paint manufacturers will be carried out, and that it is not believed the prospective shortage will make it necessary to further restrict the use of plate for paint containers.

Shortage of Pig Tin

The latest information respecting the probable supply of pig tin for the United States for the current year is decidedly disquieting, especially in connection with the strained relations with Holland over the shipping situation. It is now reported that the total imports of pig tin for the year will probably not exceed 70,000 tons, and may not go above 60,000 tons. If the latter figure is not exceeded the prospective requirements foreshadow a shortage of 35 or 40 per cent instead of 25 per cent, the basis upon which the conservation division of the War Industries Board has been working. There seems to be considerable uncertainty as to the amount of tin that can be imported during the year from the Dutch East Indies, and in this connection the officials here are plainly uneasy over the protracted delay in reaching an agreement with Holland concerning vessels plying between Batavia and the Pacific coast.

British Rationing Policy

Many applications are being received by the War Trade Board for licenses to export tin plate, but these are being rigidly examined, and in many cases rejected. No plate is being permitted to be exported to make containers for other than food purposes, and tin cans for other purposes are also denied licenses. The hand of the British Government is seen in the enforcement of this policy, which has been adopted reluctantly, and only after pointed suggestions by Great Britain, which is practically rationing the United States on tin; that for more than a year American manufacturers have shipped tin into Canada, Mexico, and other countries, where it has been used in the manufacture of containers and other articles for which British plate has been prohibited to be used since soon after the beginning of the European war.

Within a few days circulars prepared by the War Industries Board will be sent to manufacturers of bronze castings, babbitt metal and solder, suggesting various methods of economizing in the use of tin, some of which have heretofore been described in THE IRON AGE. Much waste of tin has been found in the investigations of the conservation division, and it is believed that as to all the uses referred to savings averaging 25 per cent can be made without in any way reducing the quality of the products.

Tin for Collapsible Tubes

A searching investigation of the use of tin in the manufacture of collapsible tubes is now nearing completion, and has demonstrated the possibility of saving a large part of the 4000 tons of pig tin now annually consumed in the manufacture of these articles. The use of smaller tubes will probably be abandoned, many tubes will be made with lead linings, brass caps lined with tin, cork, etc., will be used, and lighter gages of tin sheet will be employed. Probably the most important economy that will be attempted will be the salvaging of empty tubes through the agency of the American Red Cross, to which users will be urged to turn over all spent tubes. If 25 per cent of the annual consumption can be recovered in this manner it will not be necessary, if the other economies referred to are practised, to deny any important industry a reasonable supply of these containers.

A directory of engineers is being compiled by the American Association of Engineers, 20 South La Salle Street, Chicago. The information will include something of the experiences of each member and a classification is planned so that an employer, by means of the book, may be brought in touch with men of given qualifications. The book is to be published in July.

PERSONAL

W. P. Snyder, Jr., who has succeeded his father, W. P. Snyder, Sr., as president of the Shenango Furnace Co., was assistant to the president for about four



W. P. SNYDER, JR.

years, and for two and one-half years was in charge of operations. He spent nearly two years in the ore regions, also some time at the blast furnaces at Sharpsville, and four or five months in the Cleveland offices of the Shenango Furnace Co., thus gaining a practical knowledge of the business. He is a graduate of Sheffield Scientific School of Yale University, and is regarded as a very capable executive. In 1880, W. P. Snyder, Sr., with John G. A. Leishman, formed the firm of Leishman & Snyder, dealers in pig iron and steel, which was succeeded in 1888 by the present firm of W. P.

Snyder & Co. C. D. Dyer, connected with the Shenango Furnace Co. for many years, was re-elected vice-president, but owing to the heavy demands on his time as a very active member of the Pig Iron, Iron Ore and Lake Transportation Committee, and also because of the services he is rendering to the Government in other capacities, he has been relieved at his own request of some of his former responsibilities. George L. Colford, who was elected vice-president and general manager, was formerly in charge of the blast furnaces of the Clairton Steel Co. at Clairton, Pa. He accepted a similar position with the Tennessee Coal, Iron & Railroad Co. in 1903, later going with the Republic Iron & Steel Co. in the Birmingham district in the same capacity. In 1908 he entered the employ of the Shenango Furnace Co. as superintendent of furnaces. Mr. Colford has been located at Sharpsville, but hereafter his headquarters will be in the Pittsburgh offices, in the Henry W. Oliver Building in that city. He is a graduate of Princeton University. Henry Irwin, Jr., who was re-elected treasurer, and H. M. Wilson, re-elected secretary, have been connected with the Shenango Furnace Co. for many years.

R. M. Keown, professor of mechanical engineering, University of Wisconsin, Madison, has been appointed chief engineer of the Industrial Commission of Wisconsin, to succeed Sidney J. Williams, who retired June 1 to accept the position of engineer of the accident prevention division, National Safety Council, Chicago.

John R. Caldwell, until recently Washington representative of the General Fireproofing Co., Youngstown, Ohio, has received a captaincy commission in the Ordnance Department, and has been placed in charge of hand grenade production. Formerly he was central district sales manager of the General Fireproofing Co. at Youngstown.

Ralph A. Walters, assistant superintendent of the American Bridge Co., Pittsburgh, has been appointed superintendent of steel construction and installation of machinery at the new ordnance plant to be built by the United States Steel Corporation at Neville Island, Pittsburgh. Mr. Walters graduated from the Worcester Polytechnic Institute, Worcester, Mass., in 1906, and has been connected with the American Bridge Co. since that time.

Charles W. Schmidt has been promoted to district sales manager, with office in the Oliver Building, Pittsburgh, of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., and its subsidiaries; Wm. Wharton,

Jr., & Co. Easton, Pa., and the Tioga Steel & Iron Co., Philadelphia. Mr. Schmidt was formerly connected with the Philadelphia office and takes the place of J. S. Morrison, resigned.

L. D. Williams has been appointed sales manager of the New Jersey Zinc Co., New York. Bushnell Bigelow has been appointed manager of Eastern sales of the company, succeeding A. H. Peck, who resigned, and F. C. Fuller has been appointed manager of export sales.

R. L. Lunt, electrical engineer, of Minneapolis, Minn., is now connected with the sales department of the Packard Electric Co., having charge of the Minneapolis branch. The general office and works are at Warren, Ohio.

A. W. Cobb, formerly with the Domhoff & Joyce Co., Cincinnati pig iron merchant, is now manager of the foundry department of the Fulflo Pump Co., Lancaster, Ohio.

George Hutchinson, who has been superintendent of yards at the Ensley Works of the Tennessee Coal, Iron & Railroad Co., has been transferred to Mobile, where he will be superintendent of construction of the Chickasaw Shipbuilding plant of the Tennessee company, being succeeded at Ensley by C. E. Farnum. Mr. Hutchinson went to Birmingham 12 years ago from the Lackawanna Steel Co., Buffalo.

J. W. Bell, in charge of mines for the Roden Coal Co., Birmingham, has been appointed general superintendent of mines of the Gulf States Steel Co.

H. A. Hornor, consulting engineer in the marine electrical field, was appointed some time ago head of the electric welding section of the educational and training department of the United States Shipping Board, and is now located at room 303, 140 North Broad Street, Philadelphia.

In organizing the industries of the country in order to make them of the greatest possible service in war time and encouraging manufacturing near the points of consumption, Charles A. Otis, Cleveland, has been named chief of the section of resources and conversion of the War Industries Board, and directors have been appointed to carry on the work in different zones throughout the country. Among those so selected are George T. Oliver for the Pittsburgh district; M. W. Bush, president Shelby Iron Co., Shelby, Ala., for the Birmingham district; Henry I. Harriman, president of the New England Power Co. and of the Boston Chamber of Commerce, for the New England district, and George E. Crawford, ex-president Bridgeport, Conn., Chamber of Commerce, for the Bridgeport district, which covers all of Connecticut and part of Massachusetts.

Philip King, assistant sales manager for J. N. Kinney, contracting engineer, 30 Church Street, New York, was the guest of his fellow workers at a dinner at a Brooklyn restaurant on Tuesday evening. Mr. King left on Wednesday for Jacksonville, Fla., where he will join the motor transport division of the United States Army to train for service abroad.

Paul King, who has been in charge of the Lancaster, Pa., office of the Midvale Steel & Ordnance Co., has been appointed general sales agent of the Worth Steel Co., Claymont, Del., whose new open-hearth steel plant and plate mill will soon be in operation.

Col. Henry P. Bope, formerly vice-president of the Carnegie Steel Co., has been elected vice-president of the New York financial and investment house of G. G. Hynson & Co., Inc., 149 Broadway.

Henry W. Armstrong, for 25 years or more connected with the Verona Tool Works of Metcalf-Paul & Co., Pittsburgh, later with the Pressed Metal Radiator Co., at Pittsburgh, and recently connected with the National Tube Co., at Pittsburgh, has gone to Los Angeles, Cal., where he expects to make his home.

LeRoy A. Manchester, formerly in the legal department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been made secretary of that company. He will take over the former secretarial duties of W. E. Manning, who has been made vice-president and general manager of sales.

BRIDGEPORT WAGES FIXED

Labor Adjustment Board Fixes Rates for Machinists—Labor News

The Labor Adjustment Board of the Army Ordnance fixed the wage rates of machinists in the Bridgeport, Conn., district June 7. The board unanimously decided:

First. That the following standard rates per hour concluded on a basis day of 8 hours, with pay for all overtime at the rate of time-and-one-half shall be established as a standard rate for those companies which are a party to this agreement, and shall not be departed from except as provided by paragraph 3 of this decision:

Second. Toolmakers, 78c.; tool-room specialists, 64c.; machinists, general all-around, 68c.; machinists, medium and rough work, 64c.; lathe hands, 59c.; planer hands, 64c.

Work on Sunday and national holidays shall be considered as overtime.

Third. Those who receive rates of pay in excess of the above shall not be reduced in their present employment because of this decision. All employers who have been paying more than time and one-half on Sundays and holidays shall continue to pay such overtime.

Fourth. Any disputes in regard to reclassification of individuals in accordance with the above scale shall be referred to a representative who may be designated from time to time for this purpose by the War Department and his decision in each case shall be final and binding. Capt. C. E. Fitzpatrick, O. R. C., district representative of the Industrial Service of Bridgeport Section is until further notice designated as such representative.

Fifth. This decision shall take effect as of May 1, 1918.

Peacefully Adjusted

A peaceful adjustment of the labor troubles at the Pittsfield, Mass., plant of the General Electric Co. is promised by an agreement entered into by both sides, June 7. The subjects of wage increases, cranemen's troubles, and recognition of shop committees, are left to Frederick C. Hood, Boston, representing the company, and Adam Wilkinson representing the employees. They are to reach a decision before June 12, and if both parties accept the decision it is to become effective as of May 1. If the decision is rejected it is to be submitted to the full National War Labor Board, meeting in Chicago, June 12, and its decision is to be final.

Railroad Men Strike

The employees of the Readville, Mass., shops of the New York, New Haven & Hartford Railroad, numbering about 5000, went out on strike June 10. Machinists, blacksmiths, boilermakers, and all other classes of employees, are involved in the strike. It is expected that prompt action will be taken by the Federal authorities.

Scrap Bought for Italy Not Yet Sold

No disposition has yet been made of about 45,000 tons of steel scrap which is in storage at Eastern ports awaiting shipment to the Italian Government, which bought the material some months ago. Owing to the shortage of shipping space, it is unlikely that the scrap ever will be shipped to Italy, and in all probability it will eventually be taken over by the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute for the benefit of steel plants in this country. The scrap was bought by the Italian Government at a price approximating \$25 a ton, but storage charges and other expenses have advanced the cost to more than the maximum price of \$29 at which the material could be resold in this country. Attempts have been made by the Italian Government to sell the scrap here, but a price could not be paid that would be high enough to prevent a serious loss. Some of the material is said to run rather low in quality.

The Kirk Supply Co., 223 Farmers' Bank Building, Pittsburgh, has been appointed Pittsburgh representative for the Weber Chimney Co., Chicago, Ill., builder of reinforced concrete chimneys.

SHEET STEEL COMMITTEE

Ore Producers Present Their Case at Chicago Conference

CHICAGO, June 11.—(By Wire)—About 40 independent producers of Lake Superior iron ore met in Chicago to-day, H. G. Dalton, Cleveland, presiding, preliminary to presenting to the Committee on Steel and Steel Products of the American Iron and Steel Institute an appeal for higher ore prices. They assert that higher costs, coupled with increased freight rates if ore prices are not advanced, will result in their operating without profit.

In the afternoon the ore men presented their case to the Committee on Steel and Steel Products, among the members of which present were E. H. Gary, J. A. Farrell and E. A. S. Clarke. The meeting was held in the conference room of the Illinois Steel Co.

The following members of the American Iron and Steel Institute attended the meeting this afternoon:

Judge E. H. Gary, chairman United States Steel Corporation.

James A. Farrell, president United States Steel Corporation.

E. A. S. Clarke, president Lackawanna Steel Co.

John A. Topping, chairman Republic Iron & Steel Co.

L. E. Block, vice-president Inland Steel Co.

Edward Bailey, treasurer American Iron and Steel Institute.

E. J. Buffington, president Illinois Steel Co.

James A. Burden, president Burden Iron Co.

J. G. Butler, Jr., vice-president Brier Hill Steel Co., Youngstown, Ohio.

J. A. Campbell, president Youngstown Sheet & Tube Co.

A. F. Huston, president Lukens Steel Co.

D. G. Kerr, vice-president United States Steel Corporation.

Willis L. King, vice-president Jones & Laughlin Steel Co.

James T. McCleary, secretary American Iron and Steel Institute.

H. G. Dalton, Pickands, Mather & Co., Cleveland.

The members of the Institute committee will go to Duluth from this city.

New Blast Furnace and Coke Ovens at Midland, Pa.

The Pittsburgh Crucible Steel Co., a subsidiary of the Crucible Steel Co. of America, has decided to build at once a 500-ton blast furnace at Midland, Pa., where the company now has a blast furnace, open-hearth steel works and finishing mills. The melting capacity of the open-hearth works is largely in excess of the output of the present blast furnace, which is about 400 tons per day, and the company has been a buyer of pig iron in the open market when it could be secured. In order to bring up the output of pig iron to the melting capacity of the open-hearth steel works, it has been decided to build the new blast furnace. The Government will issue priority orders to the company for the building of the stack and the securing of the equipment, and it is hoped to have it in blast in a year or less. The new stack and the present furnace will give the company an output of close to 30,000 tons of pig iron per month.

The company will also build at Midland 90 by-product coke ovens, the type of which has not yet been decided upon or any contracts placed. This will likely be done this week. A contract has been made between the company and the Government, by which the latter will take the toluol and the other by-products of the coke plant for a period of two years. All these additions will be financed by the Crucible Steel Co. of America, which has very large Government contracts for war munitions.

The Pennsylvania Engineering Works, New Castle, Pa., which recently bought 35 acres near its works, states it does not expect to make any additions to its plants in the near future.

Machinery Markets and News of the Works

NEW PLANT FOR SHELLS

Symington Interests to Make 10,000 a Day in Chicago

Railroad Companies Issue Lists—Shipbuilders Are Buying Heavily

The Symington interests of Rochester, N. Y., which own the T. H. Symington Co., Symington Machine Corporation and the Symington-Anderson Co., will establish a large shell plant in Chicago capable of turning out 10,000 shells per day. The cost of the plant and equipment is estimated at \$6,500,000. Tentative orders have been placed with Chicago machine-tool houses. Inquiries have also been received in New York. The Motor Products Co., Detroit, has received a large order for 155-mm. shells and has bought equipment. The Templar Motors Corporation, Cleveland, expects another shell order and is inquiring for equipment.

It is unofficially reported that the Ordnance Bureau, War Department, will place no more contracts east of the Allegheny Mountains. This decision is said to have been reached because of the congested condition of Eastern industrial centers.

Railroad lists have appeared in several markets. The New York Central Railroad is inquiring for about 175 machines, which will cost \$500,000 or more. The Northern Pacific Railroad is also in the market. The New York, New Haven & Hartford Railroad has issued a large list for its Readville, Mass., and New Haven, Conn., shops.

A large Eastern shipbuilding corporation is proceeding with plans for the construction of two new shipyards, one at Alameda, Cal., and the other on the Atlantic Coast, the exact location not

having been announced. Builders of fabricating machinery were summoned to its office last week and asked to bid on a list of about 100 punches, shears, rolls, etc. A list of machine tools is expected soon. It is reported that the Sun Shipbuilding Co., Chester, Pa., will double its plant. The New York Shipbuilding Corporation and the Newport News Shipbuilding & Dry Dock Co. have not yet bought on their large lists, but may do so soon. The Toledo Shipbuilding Co., Toledo, Ohio, the American Shipbuilding Co., Cleveland, Staten Island Shipbuilding Co., New York, and the American International Shipbuilding Corporation, Philadelphia, are adding to their fabricating equipment.

There will be further expansion of facilities for manufacturing ship engines and boilers. The McIntosh & Seymour Corporation, Auburn, N. Y., is expected to come into the market for a list of tools for making ship engines. The De Laval Steam Turbine Co., Trenton, N. J., is adding to its equipment.

Tractor manufacturers are expanding. Henry Ford & Son, Dearborn, Mich., will build a new tractor plant and will issue a list of machine-tool equipment soon. The Northway Motor & Mfg. Co., Detroit, will buy new tools for making tractor motors. The Wolverine Tractor Co., Detroit, will build a tractor plant at Saginaw, Mich., for which equipment will be required. The Peoria Tractor Co., East Peoria, Ill., will add to its plant.

Crane inquiry is very active. The Groton Iron Works, Groton, Conn., the Bartlett-Hayward Co., Baltimore, Md., the New Britain Machine Co., New Britain, Conn., and the United States Cast Iron Pipe & Foundry Co., Philadelphia, are among those in the market for cranes. Westinghouse Church Kerr & Co., New York, have placed orders for about 10 cranes, including two of 100-ton capacity, for the Baltimore & Ohio Railroad shop at Glenwood, Pa.

New York

NEW YORK, June 11.

An Eastern shipbuilding corporation is expected to bring out a large list of machine tools within a week for the equipment of machine shops, boiler shops, etc., at two new shipyards which this corporation will build, one on the Atlantic and one on the Pacific Coast. Builders of fabricated equipment were summoned last week to figure on about 100 punches, shears, rolls, etc. Orders for cranes for shipways and shops may be placed this week, quotations having been received for about 100 cranes for each shipyard. One of the shipyards will be located at Alameda, Cal., but the location of the Atlantic Coast plant has not been announced.

Builders of fabricating equipment are figuring with several other shipbuilding companies for equipping new yards, but most of these projects are still in an indefinite state.

The New York Shipbuilding Corporation, Camden, N. J., will probably close this week for cranes for its new shipways and shops. Purchases by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., of both cranes and tools for a turbine plant at Richmond, Va., will be made as soon as formal approval of the plans is received from the Government.

The McIntosh & Seymour Corporation, Auburn, N. Y., will build ship engines for the Emergency Fleet Corporation and is reported to be preparing a list of machine tools to be bought for its plant.

The De Laval Steam Turbine Co., Trenton, N. J., has purchased additional equipment for the manufacture of turbines.

The Foundation Co., Woolworth Building, New York, has bought plate and angle shop equipment for a new shipyard.

The Staten Island Shipbuilding Co., Staten Island, New York, has purchased a plate planer, three punches, a shear and a bending roll for an enlargement of its plate and angle shop.

The T. H. Symington Co., Rochester, N. Y., is in the market for tools for a Chicago plant, where shells will be made. The Bartlett-Hayward Co., Baltimore, has been buying more tools for shell work. The New Britain Machine Co., New Britain, Conn., has placed orders in the past week for tools worth \$50,000 or more for work on gun parts.

The New York, New Haven & Hartford Railroad has issued a large list of tools for the re-equipment of its Readville, Mass., and New Haven, Conn., shops. Westinghouse Church Kerr & Co., New York, will issue a list of tools within a week for the Baltimore & Ohio Railroad locomotive repair shops, to be built at Glenwood, near Pittsburgh.

The H. H. Franklin Mfg. Co., Syracuse, N. Y., may buy a list of about 25 tools, mostly lathes and grinders, for making its own cam shafts. The Pierce-Arrow Motor Co., Buffalo, N. Y., may buy a similar list for the same purpose. The Silveco Co., Bethlehem, Pa., manufacturer of

spark plugs, has issued a list of tools for work on a Government contract.

The Liberty ordnance plant of the American Can Co., Bridgeport, Conn., has bought a number of new tools. The Becker Milling Machine Co., Hyde Park, Mass., has bought a small list of tools.

The Mead-Morrison Co., East Boston, Mass., has received a contract for gun sights but it is understood to be fully equipped for the work.

The Sprague Electric Works of the General Electric Co., Bloomfield, N. J., has bought a small list of new tools.

It will probably be several weeks before the list of machine tools for the new gun plant of the Midvale Steel & Ordnance Co., to be built at Nicetown, Philadelphia, is ready. Buying for the gun plant of the United States Steel Corporation will be done in Pittsburgh, and it is reported that the list will be ready soon.

There continues to be a flood of inquiries for cranes. The Groton Iron Works, Groton, Conn., wants seven cranes for its shipyard as follows: One 5-ton, 47-ft. 10-in. span; two 5-ton, 57-ft. 7-in. span; one 5-ton, 37-ft. 1-in. span; one 20-ton, 46-ft. 8-in. span; two 5-ton, double trolley, 27-ft. 5-in. span. The Bartlett-Hayward Co., Baltimore, Md., has inquired for two 10-ton cranes of 30-ft. span; one 15-ton, 35-ft. span, and one 15-ton of 110-ft. span. The Bethlehem Shipbuilding Corporation, Providence, R. I., wants a 10-ton crane of 38-ft. 3½-in. span and a 25-ton crane of 57-ft. 9½-in. span. The Cape Ann Anchor & Forge Co., Gloucester, Mass., is in the market for a 15-ton crane of 56-ft. span with a 3 or 5-ton auxiliary. The General Electric Co., Lynn, Mass., wants a 30-ton, four-motor crane, with 5-ton auxiliary, 85-ft. span. The New Britain Machine Co., New Britain, Conn., wants a 5-ton crane of 25-ft. 6-in. span and a 10-ton crane of 40-ft. span. The Atlantic Refining Co., Philadelphia, wants a 5-ton crane, 20-ft. span. The United States Cast Iron Pipe & Foundry Co., Philadelphia, will buy for its Scottsdale, Pa., foundry two 10-ton and two 5-ton cranes of 36-ft. 6-in. span.

Westinghouse Church Kerr & Co., New York, have awarded to the Morgan Engineering Co., Alliance, Ohio, an order for two 100-ton cranes for the Baltimore & Ohio Railroad locomotive repair shop at Glenwood, Pa., and all of the smaller cranes will be built by the Toledo Bridge & Crane Co., Toledo, Ohio. The Standard Shipbuilding Co., Staten Island, New York, has awarded to the Champion Engineering Co., Kenton, Ohio, an order for five 10-ton cranes, four of which are of 60-ft. span and one of 55-ft. span for a new boiler shop.

J. Morrison Gilmour has opened a shop at 149 Lafayette Street, New York, for screw machine work.

Considerable machinery and equipment will be required for the proposed new marine terminal and industrial plant to be constructed by the Jersey City Harbor Service Corporation, Jersey City. The company has made application to the City Commission to build the works on a tract consisting of about 160 acres in the Greenville section, near the Pennsylvania Railroad terminal, at an estimated cost of \$7,500,000. Walter H. Condict, 15 Exchange Place, is representing the company in negotiations with the city.

C. A. Goldsmith, 42 Cutler St., Newark, N. J., operating a brass foundry, has awarded contract to the Halsey Construction Co., South Orange, for a one-story brick foundry, 50 x 150 ft., on Thomas Street, to cost \$25,000.

The Standard Aircraft Corporation, Elizabeth, N. J., has broken ground for an addition to cost \$100,000.

The Titchener-Culver Iron Works, Oneonta, N. Y., manufacturer of iron and brass castings, has filed notice of dissolution.

The Northern New York Foundry & Machine Co., Glens Falls, N. Y., has been incorporated with a capital of \$25,000 by J. J. McEwan, G. S. Witham, Sr., and T. J. Bennett, Fort Edward.

The Eastern Foundry Co., Jamesburg, N. J., recently incorporated, is about to commence casting. It will specialize in the production of piano plates. W. E. Watts is in charge.

The Herbert Brush Mfg. Co., Kingston, N. Y., has awarded contract for the erection of a two-story and basement factory, 50 x 100 ft., to be erected on Greenkill Avenue, at a cost of \$30,000.

The Winter Storage Battery Co., Middletown, N. Y., has been incorporated, with a capital of \$54,000, by M. E. Slawson and E. A. Wheeler.

The Remington Arms Union Metallic Cartridge Co., 1500 Hudson Street, Hoboken, N. J., will build a one-story, steel and concrete addition to its works.

For a consideration of \$79,000 the Federal Shipbuilding Co., Kearny, N. J., has acquired two additional tracts of land adjoining its works and property recently purchased on

the Hackensack River. The land comprises two plots, 240 x 1472 ft., and 250 x 954 ft., and will be used for proposed expansion of the works.

The Progressive Machine & Tool Co., Jersey City, has been incorporated with a capital of \$100,000 to manufacture machinery and tools. George A. Kempf and William A. Nealy, Jersey City, and Edward E. Feibelkorn, North Bergen, are the incorporators.

The Franklin Mfg. Co., 105-7 Franklin Street, Jersey City, has filed notice of organization to manufacture metal goods. Martial A. Valli, 105 West Thirty-eighth Street, New York, heads the company.

Fire, June 1, destroyed part of the plant of Thomas E. Gleeson, Inc., 415 John Street, East Newark, N. J., manufacturer of wire cloth and wire goods, known as the Gleeson Wire Works. The loss is reported at \$15,000. No shut-down was necessary and the plant is in operation while repairs are being made.

The Air & Sea Craft Corporation, Hackensack, N. J., has been incorporated with a capital of \$10,000 by Plato D. Guimes, Hackensack, and George Missogenis, 25 Church Street, New York.

The Bethlehem Loading Co., affiliated with the Bethlehem Steel Co., Bethlehem, Pa., has commenced the construction of 12 units at its new ammunition works at Mays Landing, N. J., and plans for early operations at the works. A new power plant will also be constructed, and pile foundation work for this structure is now under way. The company will establish a new village at the works location to be known as Belcoville.

The Standard Aircraft Corporation, located on the Elizabeth-Linden city line, Elizabeth, N. J., will utilize part of the 11 acres in Elizabeth for new additions to increase its works capacity. The new extensions will cost about \$100,000.

A new boiler plant to cost about \$20,000 will be constructed by the Robert Gair Co., 50 Washington Street, Brooklyn, at its printing works, Plymouth and Washington streets.

The Erdman Forced Draft Burner Co., New York, has been incorporated with an active capital of \$12,000 by C. C. Rossire, W. Chenault and E. B. Nash, 26 Cortlandt Street, to manufacture burners for power plant use.

The Diana Typewriter Co., New York, has been incorporated with a capital of \$100,000 to manufacture typewriters and adding machines. H. Bidwell, 97 Warren Street, and W. C. Stout, 431 Fifty-ninth Street, Brooklyn, are the incorporators.

The Hudson Iron Works, Inc., New York, worker of structural iron work, wire, etc., has removed its plant from 409 West Thirty-sixth Street to 33 East Twelfth Street.

The Interborough Rapid Transit Co., 165 Broadway, New York, is arranging for a bond issue of \$37,700,000 for equipment and improvements, including extensions in power plants, etc., to cost about \$2,391,000.

Mott G. Gillette, Inc., New York, has been incorporated with a capital of \$100,000 by Mott G. Gillette, F. L. Boruff and A. W. Holmberg, 354 Senator Street, Brooklyn, to manufacture razors, etc.

Cordley & Hayes, 7 Leonard Street, New York, manufacturers of fibre specialties, have increased their capital from \$75,000 to \$150,000.

The Foundation Co., 233 Broadway, New York, has completed plans for the construction of a new shipbuilding works at New Orleans, La., to cost about \$1,000,000. It will be located on a site comprising about 75 acres, and will include four shipways, with machine shop, fabricating shop, riveting works and other structures for the manufacture of steel vessels. It is understood the initial works will cover over 5 acres and give employment to about 2500 men.

The Overseas Equipment Co., New York, has been incorporated with a capital of \$5,000 to manufacture aircraft and boats. C. W. Redfield, C. M. Parker and J. Keegan, Sixty-seventh Street and Sedgwick Place, Brooklyn, are the incorporators.

The J. P. Gorman Co., New York, has been incorporated with a capital of \$100,000 to manufacture automobile equipment. E. F. Wynne, C. H. Schwartzman and J. P. Gorman, 4 Third Place, Brooklyn, are the incorporators.

The New York Edison Co., Irving Place and Fifteenth Street, New York, is reported to be considering the erection of electric power plant in the Port Norris section at East 133d Street and the East River, a site recently acquired.

The Day Elder Motors Corporation, 161 Ogden Street, Newark, manufacturer of automobile trucks, is taking bids for a two-story truck manufacturing works, 125 x 450 ft., at Colt Street and Clinton Avenue, Irvington.



The first surface grinding in the manufacture of revolvers at the Colt plant, Hartford, Conn.

Buffalo

BUFFALO, June 10.

The Atlas Crucible Steel Co., Marine Bank Building, Buffalo, has increased its capital from \$1,500,000 to \$3,000,000.

The Buffalo Piston Ring Co., Buffalo, has been incorporated, with a capital of \$10,000, by A. A. Lagler, G. O. Curtis and R. H. Thompson.

The Archbold-Brady Co., Syracuse, N. Y., is operating a section of its works for fabricating ship steel for the Emergency Fleet Corporation.

The Precision Die Casting Co., Fayetteville, N. Y., is considering plans for rebuilding its plant at Pontiac, Mich., recently destroyed by fire, with loss estimated at \$25,000. The Pontiac works, acquired about a year ago from the Republic Brass & Bronze Co., consisted of a one-story concrete building, 90 x 160 ft. J. W. Knapp is vice-president and general manager.

Fire, May 26, destroyed the plant of the Berglas Mfg. Co., Sidney, N. Y., formerly known as the Sidney Novelty Co., with loss estimated at about \$100,000.

Plans have been drawn for a power house for the Warsaw Elevator Co., Warsaw, N. Y. C. E. Ketchum is president.

The F. I. Hughes & Co. Iron Works, 190 South Avenue, Rochester, N. Y., is taking bids for a one-story addition, 28 x 160 ft., to its structural plant on Lyall Avenue.

The Crucible Steel Co. of America, Syracuse, is rebuilding two of the buildings at its steel plant to make a one and four-story structure, 70 x 500 ft.

American Sterilizer Co., Erie, Pa., has awarded contract to the H. J. Conrath Co., Erie, for the construction of an additional manufacturing building, 58 x 171 ft., one story. The Lackawanna Bridge Co., Buffalo, has the structural-steel contract. The award of the contract for supplying a crane has not yet been made. George F. Hall is treasurer and manager.

The Monroe Iron Metal Cooperage Co., 510 State Street, Rochester, will build a one-story addition, 50 x 100 ft.

The Curtiss Airplane & Motors Co., Buffalo, is now turning out approximately an average of 20 battle planes and 4 hydroplanes per day, according to an announcement of President John M. Willys, who also states that the company has recently secured nearly \$25,000,000 worth of new Government airplane business.

Philadelphia

PHILADELPHIA, June 10.

L. F. Shoemaker & Co., Harrison Building, Philadelphia, operating a structural steel works at Pottstown, Pa., is reported planning to build additions to increase the capacity. The company is working on orders for steel for the Shipping Board, and it is said that the board has recommended doubling the size of the works.

The National Enameling & Stamping Co., Twenty-fourth and Walnut streets, Philadelphia, is devoting about 50 per cent of its output of its different plants to the production of enameled ware for the Government.

The Montgomery Foundry & Mfg. Co., Pottstown, Pa., has been organized to manufacture machinery and tools and to operate a foundry. It will commence operations in one of the buildings on Kelm Street, formerly used by the

Chadwick Engineering Works. Albert J. Kochel, J. Fred Seivison and Charles F. Bechtel, Pottstown, are stockholders.

The Lambert & Todd Machine Co., Camden, N. J., will erect a machine shop, one story, of brick, 20 x 40 ft.

The Lebanon Steel Foundry Co., Lebanon, Pa., is taking bids for a one-story addition, 110 x 175 ft.

The David Lupton's Sons Co., Allegheny Avenue and Tulip Street, Philadelphia, manufacturer of steel sash, etc., will build four additions to its plant. About 850 tons of structural shapes will be required for erection, contract for which has been awarded to the American Bridge Co., Philadelphia.

The Hofmann-Sproul Co., Philadelphia, iron and steel products, has been incorporated in Delaware with capital of \$100,000 by A. J. Hofmann, Philadelphia; T. J. Sproul and W. A. Faison, Chester.

The Niles Tool Works of the Niles-Reiment-Pond Co., Twenty-first Street, Philadelphia, located at Hamilton, Ohio, is having plans prepared by Harris & Richards, architects, Drexel Building, Philadelphia, for a two-story addition, 70 x 135 ft., to cost \$16,000.

The Elisha Webb & Son Co., 136 South Front Street, Philadelphia, operating a ship chandlery works, has taken bids for a one-story brick plant, 40 x 109 ft., at 1021-23 East Columbia Avenue.

The Pearce Rubber Corporation, Philadelphia, manufacturer of rubber goods, has acquired the three-story factory, boiler plant and other buildings at Twenty-first Street and Clearfield Avenue.

The Hercules Automatic Engineering Co., Philadelphia, has been incorporated in Delaware to establish a general machine works. F. R. Hansell, Land Title Building, Philadelphia, is the principal incorporator.

The Weldless Chain Corporation, Philadelphia, has been incorporated in Delaware with capital of \$150,000 by Herbert L. Maris, Philadelphia; E. J. Shinn, Gloucester City, N. J., and W. R. Cowles, Cleveland.

The Ajax Processing Co., East Venango Street, Philadelphia, has filed plans for a one-story addition, 40 x 100 ft.

The Turner & Harrison Pen Mfg. Co., Philadelphia, manufacturer of steel pens, has purchased the three-story factory building, 42 x 60 ft., now occupied, at 1211-13 Spring Garden Street, for \$10,000.

Ferdinand F. Metzger, 1038 Ridge Street, Philadelphia, manufacturer of scientific instruments, has purchased a two-story factory, about 38 x 97 ft., at Sixth and Huntingdon streets, for a new works.

The Shearer Machine Co., Waynesboro, Pa., has acquired the shops formerly occupied by the Victor Tool Co. and will operate them as a branch works.

The Nickel Alloys Co., Hyde City, Pa., has broken ground for a one-story machine shop, 40 x 80 ft. It is also planning a one-story tube mill, 140 x 250 ft. F. F. Davis is general manager.

A one-story boiler plant to cost about \$25,000 will be erected by the Board of County Commissioners, Sharon, Pa. M. M. Simons is clerk.

The Sigwart & Rolston Machine Works, Ingram, Pa., has been incorporated in Delaware with capital of \$100,000 to manufacture machinery. Kenneth P. Rolston, Ingram; Adolf Sigwart and Ephraim Sigwart, Pittsburgh, are the incorporators.

The Milton Mfg. Co., Milton, Pa., manufacturer of nuts, etc., will rebuild its forge shop destroyed by fire and double the size of the former building, which was 100 x 100 ft.

Baltimore

BALTIMORE, June 10.

The Bartlett-Hayward Co., Scott and McHenry streets, Baltimore, will build a one-story addition, 130 x 450 ft., to its plant at a cost of about \$300,000, and a one-story building, 130 x 378 ft., to cost about \$100,000. Morrow Brothers have the contract.

The construction for the Emergency Fleet Corporation, Philadelphia, by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., of the large plant on the James River for the manufacture of marine boilers, to cost about \$3,000,000, will include boiler works, riveting shop, machine shops, foundry, an electric power plant, etc. It is said that about 2000 men will be employed when the plant is operating at full capacity.

The Republic Shipbuilding & Dry Dock Co., Baltimore, is considering the construction of a shipbuilding plant near Baltimore to cost over \$1,000,000. James Donald, naval architect, 17 Battery Place, New York, is interested in the project.

Moses & Davis, Cambridge, Md., operating a shipbuilding

plant on Solomon's Island, are considering the construction of another shipyard on a site on Cambridge Creek, near the Cambridge & Seaford Railroad. A new company, it is understood, will be organized to carry out the project.

The Baltimore & Ohio Railroad Co., Baltimore, is having plans prepared for a one-story engine house at Grafton, W. Va., to cost about \$150,000.

The Southern Iron Works, Norfolk, Va., has been incorporated with a capital of \$25,000 by J. N. Smith and C. M. Surles, Norfolk, to manufacture iron and steel products.

The Mains Foundry Co., Jacksonville, Fla., is planning the rebuilding of its main foundry, recently damaged by fire. It will be 35 x 90 ft., and will be equipped for the production of iron and brass castings. M. C. Mains is president and F. W. Brown is manager.

The Worthington Mfg. Co., St. Petersburg, Fla., has been incorporated with a capital of \$50,000 by R. B. and L. E. Worthington, and H. D. Werkheiser, St. Petersburg, to manufacture metal goods.

The Interstate Foundry Co., Anniston, Ala., recently incorporated with a capital of \$25,000, will take over and operate the plant of the Interstate Roofing & Foundry Co., for the production of gray-iron castings. G. G. Britton heads the company.

The Jones-Hernandez Machine & Foundry Co., Birmingham, Ala., is planning the construction of a new foundry.

The National Pipe & Foundry Co., Attalla, Ala., has increased its capital from \$75,000 to \$100,000.

Chicago

CHICAGO, June 10.

The attention of the machine-tool trade is largely centered in the development of a large shell-plant which is to be established in this city by the Symington interests of Rochester, N. Y., associated with local business men. No official statement of a definite character has been made, but the Chicago Association of Commerce, which, with other business organizations has been working to secure the location of more war plants in the West, states that the cost of the new plant is estimated at \$6,500,000. It is planned to produce 10,000 shells a day. At least tentative orders have been placed with three or four machine-tool houses. The principals involved are expected in Chicago June 11.

Through the efforts of the Illinois Manufacturers' Association war contracts amounting to \$7,000,000 were awarded to Illinois manufacturers in May, most of which called for non-metal goods, although some ordnance supplies, motor equipment and steel and iron castings were purchased.

Anticipating stricter Government requirements in the matter of machine tools, some dealers are preparing themselves by obtaining from the customers detailed information as to the uses to which tools which have been sold, but not delivered, will be put. Should the tool builders require this information from their agents, the latter will be in a position to supply it quickly.

The only machines obtainable without priority certificates are second-hand tools, and a few new small machines, which dealers have on their floors. A continuance, and perhaps a tightening, of the situation with regard to large tools is expected in view of the large ordnance projects under way in various sections of the country. It is pointed out that the demand for smaller machines will grow proportionately, inasmuch as even the largest ordnance pieces have small parts for the production of which small tools will be needed. Among the machines which are extremely scarce are boring mills, both horizontal and vertical, and planers, 36-in. and over. The demand for punch presses is becoming quiet, which is evident not only by the smaller inquiry, but by the fact that manufacturers are beginning to fill stock orders.

The McDougall-Duluth Co., shipbuilder, Duluth, Minn., and the Northern Pacific Railroad are in the market for tools. The Great Northern, Northern Pacific and Omaha railroads have been authorized to make improvements totaling nearly \$1,000,000 at their terminals in St. Paul this year. The Northern Pacific will use \$250,000 for a car repair shop. At Omaha the Great Northern will complete shops at a cost of \$200,000.

The Universal Draft Gear Attachment Co., Chicago, has purchased from the Whiting Foundry Equipment Co., a steel casting plant in Harvey, which will be operated as the Allied Steel Castings Co. The purchasing company is controlled by John T. and James S. Llewellyn, of the Chicago Malleable Castings Co., and Silas J. Llewellyn, president Interstate Iron & Steel Co. The site embraces five acres improved with brick buildings.

To handle Government contracts, A. B. Dick & Co., mimeograph manufacturers, will erect a two-story factory,



The final factory operation in the Colt revolver plant is the dipping in heavy oil prior to packing for shipment.

209 x 415 ft. at Lake and Albany streets, Chicago, at an estimated cost of \$300,000.

The Peoria Tractor Co., East Peoria, Ill., has purchased property it has been occupying, also additional land, to provide for future extensions. Plans have been made for the immediate enlargement and remodeling of the present factory. The company is reported to have heavy orders for a tractor of new model.

It is reported that the General Motors Co. will construct at Saginaw, Mich., a large gray iron foundry, located half a mile north of the company's property known as the Peninsular Shell Co. President W. C. Durant of the General Motors Corporation was in Saginaw recently in connection with the project.

The Electric Steel Co., South Wood Street, Chicago, has filed plans for the erection of a new brick foundry at 1801-31 West Thirty-first Street, to cost about \$100,000.

The Chuse Engine Co., Mattoon, Ill., is taking bids for the erection of a one-story foundry, at Prairie Avenue and North Fourteenth Street, 95 x 120 ft., to cost about \$25,000.

Milwaukee

MILWAUKEE, June 10.

Inquiries for machine-tools received by local manufacturers the past week or 10 days are indicative of enormous requirements from all parts of the country. Orders are being placed on a fairly large scale, but the bulk of the business is yet to come. Makers of milling machines report the demand for the heavier types is particularly active and their capacities are so well occupied that they are quoting not earlier than September and October delivery, depending upon the kind desired.

The shortage of labor grows more acute. The report of the Milwaukee Free Employment Bureau for the month of May shows that requests were received for 4357 men, while only 3074 were available, a shortage of 1283, compared with approximately 1000 in April and about 300 in May, 1917. The employment of women grows steadily. A local steel foundry now employs eight women in its core-room, paying wages of 28c. to 32c. per hr. On light machine work, women are receiving from 32c. to 35c. per hr.

The Pelton Steel Co., Milwaukee, has abandoned its plan for the present to erect a new steel foundry in place of the present works at Chicago Road and Elliott Place. It will begin work at once, however, on a new shipping and cleaning room, 45 x 60 ft., costing \$10,000, and a new storage shed. T. H. Harvey is general manager.

The Globe Foundry & Machine Co., 521 North Ninth Street, Sheboygan, Wis., has increased its capital stock from \$50,000 to \$75,000 to accommodate its increased business.

The Modern Pattern Co., 126-150 Clinton Street, Milwaukee, is installing considerable new pattern-making machinery and eight electric motors, from 1½ to 5 hp. George Vierhellig is president.

Milton M. Bonz, Munising, Mich., who recently disposed of his wood-working mill to the Cleveland-Cliffs Iron Co., has purchased a site at Masonville, near Escanaba, Mich., and proposes to erect a general woodenware factory at an estimated cost of \$40,000.

The board of education, Morrisonville, Wis., has engaged Edward Tough, architect, 24 East Mifflin Street, Madison,

Wis., to prepare plans for a three-room addition to the high school to provide manual training facilities.

The Filer & Stowell Co., Milwaukee, has broken ground for a new forge shop of brick and steel construction, 60 x 150 ft., on Becher Street, near the Milwaukee Road tracks. The construction is being done under the direction of the company's engineers.

The board of public works, Manitowoc, Wis., is taking sealed proposals until 4 p. m. June 14, for furnishing a 1500-kw. turbo-generator unit, with appurtenances, for the municipal electric light and waterworks plant. Walter C. Staefler is city clerk.

The board of education, Elroy, Wis., is taking bids for the erection of a new high school, with manual training department, designed by Parkinson & Dockendorff, LaCrosse, Wis. O. F. Miller is secretary of the board.

The Falls Motors Corporation, Sheboygan Falls, Wis., on June 15 will begin the operation of a one-story machine-shop addition, 60 x 130 ft., erected to accommodate its Government contracts for airplane, truck and tractor power units. The plant is now running 22 hr. per day. The total payroll is in excess of 550 and from 125 to 150 additional workmen could be used if they were available.

The Western Malleables Co., Beaver Dam, Wis., has started work on a Government contract for malleable iron parts for 10,500 freight cars. This, with other bookings, will keep the plant at full capacity for several months. Ernest E. Smythe is general manager.

The Maynard Steel Casting Co., 716 Reed Street, Milwaukee, for some time past using the electric steel process exclusively, has changed its corporate name to the Maynard Electric Steel Casting Co.

The Western Rope & Mfg. Co., Tulsa, Okla., and Milwaukee, has started work on additions to the gray iron foundry at Cedarburg, Wis., recently acquired with additional acreage. A 10-ton crane will be installed. James K. Bradley is general manager of the Milwaukee and Cedarburg plants.

The Reliance Motor Truck Co., Appleton, Wis., is negotiating for a contract for approximately 4000 military trucks. The new plant under construction is expected to be ready for equipment within a fortnight and operations will begin shortly after July 1 on business already booked. Ira L. Miller is president.

The LaCrosse Tractor Co., LaCrosse, Wis., has leased the former municipal pumping station building and is converting it into an office and drafting room, the present offices being devoted to manufacturing. The company has more than 600 workmen on its payroll.

The Municipal Appliance Co., Madison, Wis., recently organized with a capital stock of \$50,000, will specialize in the manufacture of cast-iron traffic posts.

Detroit

DETROIT, June 10.

The total of munition orders in Detroit is rapidly increasing. Automobile concerns are turning almost entirely to the manufacture of airplane motors and ordnance materials. Announcement is made by bankers of the city that Detroit is now making 92½ per cent of the Liberty motors contracted for and at least 33 1/3 per cent of the plane supply. It is estimated that 19,000 Liberty motors will be completed by Sept. 1, and that within four months 50 complete battle planes per day will be turned out. The Lincoln Motor Co., the Packard Motor Co. and the Cadillac Motor Co. are doing the bulk of the engine work, while the Fisher Body Corporation has a large contract for planes. Due to the continued rush of new munition orders, machine-tool dealers report an active market. Few machines are sold for other than war purposes, but the total demand is good, especially for standard machines of the finer grades.

Shipbuilding companies are working to capacity and increasing their output daily. High wages paid men in these industries is reported to be causing further labor trouble in other industries. Detroit is shy 35,000 workmen, a large proportion of them in the skilled class. Women are being used by the thousand and the available supply is about used up.

Numerous war orders have been placed in this district recently. Among them are the following: Orders for 3 to 5½-ton half trucks to the Packard Motor Car Co., Detroit, and Republic Motor Truck Co., Alma, Mich.; increased orders for Liberty motors to the Ford Motor Co., Detroit, which expects to turn out 100 per day within a short time; ordnance contracts with the C. R. Wilson Body Co., Detroit; the Detroit Copper & Brass Rolling Mills, Detroit; Smith-Hinchman & Grylls, Detroit; the Rice Sorin

Saddlery Co., Muskegon, and C. A. Spears & Sons, Grand Rapids.

Contracts for 12 more ships have been given to the Saginaw Shipbuilding Co., Saginaw, Mich., more than doubling its orders. The new contract calls for 4200-ton vessels in place of the 3500-ton now being constructed.

The Power Truck & Tractor Co., Detroit, has been organized by prominent automobile manufacturers. The company is planning to bring out 1, 2, 3 and 5-ton trucks and two tractor models. Its program calls for several thousand trucks and tractors the first year. Leslie R. Acton, formerly with the Maxwell, Studebaker and Redden organizations, is president of the company. L. P. Helm, formerly with the Olympian Motor Car Co. and the Wisconsin Motor Co., is vice-president and engineer, and George L. Brush, formerly with the Studebaker, Canadian Maxwell and Elgin companies, is secretary and treasurer. F. W. Thomas, who was manager and designer of the Sandusky Tractor Co., is the tractor engineer.

The Lambert Machine Co., Marshall, Mich., has taken over the factory of the Paige Brothers Buggy Co., Marshall, on an exchange basis. The Lambert Co. expects to move in August.

The Motor Products Co., Detroit, has received a contract for 155-mm. shells and has bought equipment.

The Metal Products Co., Detroit, has taken over the passenger-car business of the Timken-Detroit Axle Co., Detroit, and is buying new equipment.

Henry Ford & Son, Detroit, will build a new plant for the manufacture of tractors, and will issue a list of machine tools soon.

The Northway Motor & Mfg. Co., Detroit, is bringing out new tractor motors, for the manufacture of which new tools will be purchased.

The property formerly occupied by the Central Boiler & Supply Co., Grand Rapids, Mich., has been taken over by the Michigan Boiler & Iron Works, recently organized and capitalized at \$15,000. The stockholders are Peter A. Geldhos, John Snitseler, William R. Cook, and Carroll S. Sweet.

The MacKinnon Boiler & Machine Co., Bay City, Mich., has sold its factory site to the Industrial Works, Bay City, and will discontinue manufacture about July 1.

The Romeo Foundry Co., Romeo, Mich., will enlarge its plant and add several hundred men to its working force. A plant will also be built in Sarnia, Ontario. A tractor will be brought out by the Romeo company within the next few months.

For the purpose of supplying electricity to the foundry being erected in River Rouge, Henry Ford is said to have acquired mill property in Southfield, Oakland County, Mich., together with the machinery and water-power rights.

E. I. du Pont de Nemours & Co., Wilmington, Del., has secured control of the Flint Varnish & Color Works, Flint, Mich.

The H. R. Lewis Tool Co., Detroit, has filed articles of incorporation with a capital stock of \$50,000. Lewis Lowenstein is the principal stockholder.

The Continental Electric Co., Detroit, has been incorporated with a capital stock of \$10,000 by Morgan R. Bryant and others.

The American Metal Products Corporation, Detroit, has filed articles of incorporation with a capital stock of \$25,000. Stevens Marossy, Frederick C. Matthaer, and Roy H. Curtiss are the principal stockholders.

The Ramsey-Alton Mfg. Co., Portland, Mich., has secured a contract amounting to \$500,000. The company will manufacture parts of army trucks, such as axles, brake blocks and tongues.

The Foundation Co., Port Huron, Mich., has a contract pending with the United States Navy for the construction of five 280-ft. revenue cutters. It is now building ten 250-ft. boats for the French Government.

The Detroit Steel Castings Co., 1243 Michigan Avenue, Detroit, has let contract to E. F. Lang, Detroit, for the construction of an intermediate floor in its plant.

The Wolverine Tractor Co., 1805 Ford Building, Detroit, will erect a plant at Saginaw, where \$100,000 will be subscribed locally to further production. It is in the market for factory equipment, including a pneumatic riveting plant, lathes, milling machines, drill presses, etc. W. G. Wagenhals is vice-president.

The Peninsular Shipbuilding Co., Muskegon, Mich., is having preliminary plans prepared for its proposed new shipbuilding plant to cost about \$200,000 for initial struc-

tures and equipment. The works will consist of about 12 one and two-story buildings. F. D. Chase, 122 South Michigan Avenue, Chicago, is architect.

The American Car & Foundry Co., Ferry Avenue, Detroit, has broken ground for the erection of a one-story addition, about 60 x 300 ft., to cost \$18,000.

The Lapeer Tractor Truck Co., Lapeer, Mich., has commenced the construction of a new one-story plant, 60 x 200 ft., on Saginaw Street, to cost about \$30,000.

Cleveland

CLEVELAND, June 10.

New inquiries for a large amount of machine tools are pending, mostly for railroads and shipyards. There is also quite an active demand for tools for shell work, with a good volume of business in single tools. The dominating feature of the market is the inquiry of the New York Central Railroad, which has issued various supplemental lists in addition to the original list that came out two weeks ago, until now its total requirements include approximately 175 machines amounting to about \$500,000. It is stated that the entire requirements for the shops west of Buffalo are included in the lists that have been issued.

The Toledo Shipbuilding Co., Toledo, Ohio, is inquiring for 10 machine tools, and the American Shipbuilding Co., which recently issued a list of punching and shearing machines, has come out with a supplemental inquiry covering about 25 machine tools. Another shipyard inquiry is for 19 punching and shearing machines for Hog Island. The Parish & Bingham Co., Cleveland, has placed an order for 10 1½-in. screw machines.

The machine tool lists issued by the purchasing department of the New York Central Railroad in Cleveland cover requirements for its locomotive shops at Collinwood, Ohio, Gibson and Elkhart, Ind., and for practically all the car shops maintained in connection with these lines. The equipment for the locomotive shops includes lathes, planers, a 600-ton wheel press, and a 90-in. driving-wheel lathe, drill presses, turret lathes, shapers, planers, bolt heading and threading machines, etc. The requirements of the car shops include drilling machines, wheel borers, axle and engine lathes, plate-bending machines, and considerable wood-working machinery. It is the company's plan to replace the present equipment in the Gibson shops with entirely new machinery. Small machine shop equipment will be purchased for a new roundhouse to be built at Coalburg, Ohio. Two 10-ton and one 20-ton electric traveling cranes and four locomotive cranes are wanted for the Collinwood shops.

The American Shipbuilding Co., Cleveland, which a few days ago issued a list of punching and shearing machinery requirements, has sent out another list including the following engine lathes: 50-in. x 20 ft., 48-in. x 20 ft., 42-in. x 20 ft., 36-in. x 20 ft., two 30-in. x 18 ft., four 24-in. x 16 ft., four 16-in. x 10 ft.; also one 36-in., one 30-in., and four 25-in. vertical drilling machines; one No. 3, one No. 4, and three No. 5 universal milling machines; one 16-in. slotter, and one 24-in. shaper.

The National Screw & Tack Co., Cleveland, will erect a seven-story addition, 80 x 130 ft., for general manufacturing purposes. It will need additional machinery, but its requirements have not yet been outlined.

The Cleveland Armature Works, Inc., will shortly place contracts for a two-story addition, 40 x 150 ft.

The Triumph Machine Tool Co., Cleveland, has increased its capital stock from \$15,000 to \$200,000.

The Lake Erie & Western Railroad Co., through the purchasing department of the New York Central Railroad, is inquiring for about 10 machines, including lathes, shapers, bolt cutters and portable tools.

The Templar Motors Corporation, Cleveland, which is engaged in machining 6-in. shells, expects to take another shell order that will necessitate increasing its capacity, and is inquiring for a round lot of lathes and some other equipment.

The P. A. Geler Co., Cleveland, will erect a two-story factory addition, 38 x 64 ft.

The Toledo Shipbuilding Co., Toledo, Ohio, has an inquiry out for a 4 and 6-ft. radial drill; 36-in. x 24-ft. lathe; 30-in. x 18-ft. lathe; two 24-in. x 12-ft. lathes; large horizontal boring mill; 32-in. x 10-ft. planer; 48-in. or 60-in. open-side planer; and a 24 or 28-in. shaper. The company is planning the erection of a new machine shop, 48 x 30 ft., with a wing 100 ft. long.

Canton

CANTON, OHIO, June 10.

The Ohio Machine & Mfg. Co., Canton, has been organized, with a capital stock of \$150,000, and will occupy the plant formerly used by the Advance Dairy Machine Co. L. E. Griffiths and H. S. Colby, formerly associated with the Barberton, Ohio, plant of the Babcock & Wilcox Co., are president and vice-president respectively. W. H. Cavanah of the Canton Foundry & Machine Co. is secretary and treasurer. At present the company plans to engage largely in Government work and later to do jobbing work and manufacture machinery. In addition to the machinery formerly used by the Advance Co. it will require considerable additional equipment, including four planers.

The extensions to the plant of the Timken-Roller Bearing Co., Canton, now under way, will include a one-story brick, steel and concrete building with a modified saw-tooth roof and a two-story wing to be used for the stamping, assembling, storage and shipping departments, and an extension to the mill building, 85 x 410 ft., for the storage of scrap and steel mill supplies. The company is also erecting two additional 100,000-gal. tanks for the storage of fuel oil, doubling its present capacity.

The Atlas Machine & Die Co., Canton, has established a plant in the building occupied by the Canton Brass Co., and will manufacture special machinery and dies. P. H. Effinger is at the head of the company.

The Kittoe Boiler & Tank Co., Canton, is planning additions that will more than double the capacity of its present plant.

It is announced that a contract amounting to about \$200,000 for machining forgings for 75-mm. guns will be divided among several Canton manufacturers whose plants have the necessary equipment.

The Standard Pattern Works, Canton, has changed its name to the Johnston Pattern Co., and has doubled its capacity. H. P. Johnston is general manager.

Cincinnati

CINCINNATI, June 10.

There is a very urgent call for large machine tools. Only the smaller sizes of lathes are not in demand, although makers of these machines have sufficient work ahead to keep them operating for some time to come. Second-hand machine tool dealers have been scouring the country for boring and turning mills but are unable to find any in this vicinity. Both upright and radial drilling machines are in heavy demand.

Foundries are making fairly good deliveries on castings, but in some instances delays are experienced, due to the scarcity of labor.

Labor troubles at Hamilton, Ohio, have again appeared. Although a settlement with the union machinists was made several months ago, a new demand for an increase in wages of 10c. per hr. has been made. At the time of the demand it was stated that no strike was contemplated but that the machinists would go to other manufacturing points if it was not granted. On Saturday last in two machine tool plants the machinists walked out and it is reported that other plants will be affected within a few days.

The Queen City Brass & Iron Works Co., Cincinnati, has let contract to the M. Marcus Building Co. for a one-story addition to its plant on Hopple Street.

The foundry of the National Stove Repair Co., Miamisburg, Ohio, has commenced operations. William Kramer is general manager.

The Recording & Computing Machines Co., Dayton, Ohio, is building an addition to its plant that will contain 30,000 sq. ft. of floor space.

The plant of the Wapak Holloware Co., Wapakoneta, Ohio, is being overhauled and additional equipment installed. The company recently received a large Government order for feed cookers for use in France.

The Continental Tractor Co., Continental, Ohio, has been incorporated with \$100,000 capital stock by W. H. Lowe and others. Nothing is yet known as to manufacturing plans.

The Producers Supply & Tool Co., Marietta, Ohio, has been incorporated with \$100,000 by L. Gimsburg and others. The company has heretofore operated under a partnership arrangement and deals principally in oil well equipment and supplies.

The Southern Locomotive Valve Gear Co., Knoxville, Tenn., is inquiring in this market for a second-hand horizontal boring mill with a 3 to 4-in. bar. H. P. Strayer is general superintendent.

The Central South

LOUISVILLE, June 10.

Henry Vogt, president Henry Vogt Machine Co., Louisville, has been taking considerable interest in a movement of the Louisville Board of Trade and the Louisville Industrial Foundation to secure a larger percentage of local war orders. Plans have been taken up again for locating a bureau in Washington to look after Louisville industrial interests.

The Eureka Machine Tool & Supply Co., Winchester, Ky., recently incorporated, has taken over the entire Kentucky business of the McJunkin Machine Co., including the plant at Winchester, where a machine and tool shop was operated. The company is capitalized at \$50,000. The incorporators are Wolf Beren, Joseph O. Becker and Harry H. Breen.

The Chesapeake & Ohio Railroad Co., out of its \$18,000,000 budget for improvements, plans a new roundhouse and improved shop at Russell, Ky. The amount to be expended has not been determined.

The A. S. Hendricks Optical Mfg. Co., Lexington, Ky., manufacturer of optical machinery, has installed a new lathe and plans purchasing additional shop equipment.

The Illinois Central Railroad Co. has let contracts to the Joseph Nelson & Sons Co., Chicago, for \$250,000 roundhouse and shop improvements at Paducah, Ky.

E. L. Payne, Louisville, has a contract to erect a new machine shop for Wuest Brothers, 934 West Hill Street.

The Zier Boiler & Sheet Iron Works, Jeffersonville, Ind., has purchased additional ground preparatory to enlarging its plant.

The Bull Creek Coal Co. will install 25 and 40-hp. boilers, engines, pumps, etc., in a new plant to be established at Prestonburg, Ky.

The Lingo City Metal Works, Wilmington, N. C., wants dealers' prices on four 150-hp. or six 100-hp. return tubular boilers, separate stacks and all required fittings; also boiler pumps.

Charles T. Lehman, 1921 Powell Avenue, Birmingham, Ala., is in the market for second-hand machinery, including 2000 to 3000 ft. capacity air compressor; three 150-hp. boilers, Scotch, marine and locomotive, economic or other portable types, must be over 100-lb. pressure; one 200 to 250-volt kw. direct-current generator; three 90 to 110-hp. portable locomotive boilers.

The Stickney-Montague Co., Chattanooga, Tenn., has been incorporated in Delaware with capital of \$500,000, to manufacture machinery, special machines, etc. D. P. Montague, Charles A. Stickney and C. C. Paris, Chattanooga, are the incorporators.

Indianapolis

INDIANAPOLIS, June 10.

The Hill Pump Co., Anderson, Ind., has put in operation a second plant, having bought the factory formerly owned by the Wagner Axle Co. It needs additional space to take care of Government orders, amounting to \$6,000,000, for turbines and gears for propellers. The original plant is being enlarged by a foundry, machine shop and boiler house at a cost of \$100,000. The foundry will be equipped with three traveling cranes and six gib cranes.

The Wabash Tractor Co., Wabash, Ind., has been incorporated with \$1,000,000 capital stock to manufacture tractors. The directors are Fred B. Walter, T. F. Vaughn, M. C. Honeywell, R. J. Evans, L. L. Hyman, E. O. Ebbinghouse and Charles S. Haas.

The Eclipse Mfg. Co., Belvedere, Ill., manufacturer of automobile parts, has increased its capital stock from \$50,000 to \$150,000.

The Pennsylvania Railroad Co. will build additional locomotive shops at Peru, Ind., to cost \$1,000,000.

The Peru Electric Mfg. Co., Peru, Ind., has been sold to Frank Moeck, Peru. It employs nearly 200 workmen.

Further Government orders for army truck parts booked by Indiana manufacturing companies are: Standard Wheel Co., Terre Haute, wooden wheels; Warner Gear Co., Muncie, steering gears; Remy Electric Co., Anderson, 8000 distributors; Indiana Lamp Co., Connersville, 2500 sets of lamps; Prest-O-Lite Co., Indianapolis, 3000 batteries; Muncie Gear Works, Muncie, 1500 transmissions. The Gary, Ind., plant of the Illinois Steel Co. will manufacture 80,000 axles for freight and passenger cars.

The Powell Tractor Co., Elwood, Ind., has been incorporated with \$50,000 capital stock to manufacture farm machinery. The directors are Wilfred Sellers, C. L. Bruce, Arthur Wylie, John Powell and Sherman B. Harting.

The Indiana Canning Machinery Co., Indianapolis, has been incorporated with \$10,000 capital stock. The directors are Frank H. Langsenkamp, Elmer C. Prange and James E. Lindley.

The Rayle Dimmer Co., Indianapolis, manufacturer of dimmers, has increased its capital stock from \$15,000 to \$50,000.

The W. K. Milholland Machine Co., Indianapolis, whose plant was recently destroyed by fire, is having a building erected at Twenty-third Street and the Belt Railroad, 48 x 148 ft., one story. An L, 30 x 59 ft., will house part of the equipment for the manufacture of turret lathes. W. K. Milholland is president.

The Shadloe Automatic Train Signal Co., Indianapolis, has been incorporated in Delaware with capital of \$100,000 to manufacture railroad signals. C. F. Shadloe, Indianapolis; S. Avritt, Louisville, Ky.; and Charles M. Evans, Cincinnati, are the incorporators.

The Buettner & Shellburne Machine Co., Thirtieth Street, Terre Haute, Ind., is building a one-story addition, 50 x 200 ft.

The Oliver Chilled Plow Co., South Bend, Ind., has broken ground for a new one-story forge shop, 96 x 100 ft.

St. Louis

ST. LOUIS, June 10.

The Gregory Gin Co., Gregory, Ark., has been organized by W. N. Gregory, J. D. Eldridge and R. T. Harvulle, and is in the market for about \$8,000 worth of cotton ginning and power plant machinery.

The Marion County Drainage District, Palmyra, Mo., J. T. Hansbrough in charge, is in the market for ditching machinery and other equipment.

The Garber Light & Ice Co., Garber, Okla., will expend about \$20,000 for new equipment. William Musser is in charge.

Yale, Okla., has plans for the expenditure of about \$100,000 on new electric light plant equipment.

The Oktaha Mill & Elevator Co., Oktaha, Okla., will expend about \$6,000 on new plant and power equipment. J. B. Kilgore, Jr., is in charge.

The Medart Patent Pulley Co., St. Louis, will build a foundry 150 x 300 ft., for which equipment will be required.

The Oklahoma Cotton Chopper Co., Ardmore, Okla., has been incorporated by Walter Colbert, J. W. Weeks and others and will equip a plant requiring about \$25,000 worth of machinery.

The Great Western Metal Co., Oklahoma City, Okla., has been organized by Sam Bloomfield and others and will equip a foundry requiring about \$10,000 worth of machinery, etc.

The A. Gilbert & Sons Brass Foundry, St. Louis, Mo., will remodel and enlarge its brass foundry, adding equipment to cost about \$10,000.

The Talbot Reel & Mfg. Co., Kansas City, Mo., 314 East Eighth Street, will equip a \$70,000 factory for the manufacture of metallic fishing reels and similar products.

The Missouri, Kansas & Texas Railway, F. Ringler, chief engineer, Dallas, Tex., will equip a roundhouse, machine shop, boiler plant, engine house and other buildings at Appleton City, Mo.

The Delta Shipbuilding Co., New Orleans, La., organized by the Concrete Engineering Co., Chicago, will equip a plant at New Orleans for building concrete vessels.

The Doullut & Williams Shipbuilding Co., capital \$1,000,000, New Orleans, organized by M. P. Doullut, W. Horace Williams and others, will build a plant for the construction of 9600-ton steel ships, for which it has a Government contract amounting to \$15,000,000.

The Crunden-Martin Mfg. Co., St. Louis, will equip an addition to its metal and woodenware manufacturing plant to cost about \$75,000.

The Minden Lumber Co.'s plant at Minden, La., has been destroyed with a loss of \$250,000. It will be re-equipped.

Roy R. Winans, Independent Building, Joplin, Mo., is in the market for 2 to 4-in. pipe and bolt machines.

The Traction Vending Machine Co., Pine Bluff, Ark., has recently been incorporated with a capital of \$100,000. J. P. Wright, J. H. Mann, Jr., and A. Z. Orto, Pine Bluff, are the incorporators.

The Golden Cycle Mining Co., Cripple Creek, Colo., is planning for the construction of a new electric power plant to cost about \$200,000 at Pikeview, near Colorado Springs.

Henry E. Mueller, St. Louis, is having plans prepared for the construction of a two-story foundry, 70 x 100 ft., to cost about \$25,000.

Texas

AUSTIN, June 8.

As a result of the extensive oil development in progress over a wide area of central western Texas, the demand for well-boring and oil-pumping equipment is very large.

The B. V. D. Electric Mfg. Co. has been incorporated at San Antonio, with a capital stock of \$25,000. John B. Herff is a stockholder.

The Cement Supply & Products Co., Beaumont, will build a plant for manufacturing cement products.

The Waco Electrical Supply Co. has increased its capital stock from \$20,000 to \$30,000.

L. D. Jones, Dallas, has invented a process for manufacturing paper from cotton stalks, and is promoting a company which plans to build a 20-ton paper mill in which the new process will be used. Z. E. Marvin, Dallas, and others, are interested in the project. The proposed plant will cost about \$350,000, it is stated.

The Consumers Gas & Fuel Co., Mineral Wells, has been incorporated, with a capital stock of \$5,000,000, for the purpose of supplying Dallas, Fort Worth, Weatherford and Mineral Wells with natural gas for manufacturing purposes. The company will have its principal offices in Mineral Wells, and will lay pipe lines to the cities to be supplied with fuel. The incorporators are G. E. Wilson, T. A. Gross and Frank Corn, Mineral Wells; Arthur B. Case, Fort Worth; and H. W. Kutman, Weatherford.

California

SAN FRANCISCO, June 4.

Machinery houses report that most of the recent orders have been of the "fill-in" nature. Excepting machinery going into the shipyards, there have been very few orders for large tools, although there has been plenty of inquiry. Many of the inquiries received have been accompanied by the statement that the yard, mill or shop was waiting to see what the Government was going to do, and it is assumed by machinery men that many industries are waiting for actual Government money advances before they enlarge their plants. This assumption does not seem unreasonable when it is realized that many plants are not able to finance themselves for greater expansion, and if they had the necessary funds it would be a serious risk to expand beyond what might be useful after the war. Reasoning on this basis, local machinery men say they expect their business to show great increases after July 1, the beginning of the next fiscal year.

There are six large steel shipyards about the bay, five in active operation. These yards have contracts for 92 vessels aggregating 1,000,000 tons, and 65 carloads of steel are arriving daily for fabricating these ships.

The Rolph Shipbuilding Co., San Francisco, has begun the construction of its shipyards on the Alameda estuary, where plans have been perfected for five or six slips for building wooden ships similar to the vessels which it is building at Eureka. The dredging and filling has nearly been completed, and the erection of the shops will follow at once.

The Moore Shipbuilding Co., Oakland, has let a contract for a two-story steel and frame plate punching shop to cost \$39,000.

The Union Construction Co., San Francisco, is calling for bids for a one-story plate shop, 90x380 ft., to be built at its plant in Oakland. The company announces that it will conduct its shipbuilding activities under the name of the Union Industrial Works. The change is made because of an error made by the Emergency Fleet Corporation in awarding contracts for ships under the latter name.

The San Francisco Shipbuilding Co., San Francisco, which built the concrete ship Faith at Redwood City, it is stated, will superintend all concrete shipbuilding at this point for the Government. It is understood that Government Island, in inner Oakland Harbor, has been chosen for the Government concrete shipyards. The Emergency Fleet Corporation, Washington, has made a 25-year lease of the island, and it is said the proposed works will cost over \$5,000,000. The Faith made a successful trip from San Francisco to Puget Sound, and in consequence an order for eight such ships of 7500 tons each is expected to be placed here at once.

The Shipley Construction and Shipfitting Co., New York, will erect a refrigeration installation plant at Alameda to equip with refrigerating machinery ships which are built on the bay and are designed to carry foodstuffs.

V. K. Sturges, Oakland, will erect a one-story concrete factory, 60 x 600 ft., to cost \$100,000, for manufacturing tires.

The Holt Mfg. Co., Stockton, is now working two shifts making caterpillar engines for domestic purposes and harvesting machinery. Sixty tons of castings per day are being poured. The caterpillars are being turned out at the rate of 100 per year.

The Judson Iron Works, Oakland, has just added equipment to enable it to make 30-in. diameter sand-cast forging ingots equal to Lloyds' standard.

Louis G. Henes, San Francisco, dealer in machine tools, shop equipment, cranes, etc., has established a Los Angeles branch at 902 Hibernia Building, under the management of C. E. Taylor, formerly associated with the Eccles Smith Co., Los Angeles. Frank M. Morgan, formerly with the Pacific Tool & Supply Co., has joined his selling force in San Francisco.

The Terminal Gas & Machinery Co., Long Beach, has been incorporated, with a capital of \$50,000, by W. F. Fisher, C. A. Gee and C. Beyer.

The Pacific Truck & Tractor Co., Oakland, has been incorporated, with a capital of \$20,000, by F. H. Thatcher, H. M. Hobson and E. E. Nichols.

The Southwestern Shipbuilding Co., San Pedro Harbor, Los Angeles, has filed plans for new shop buildings at its works near the Fish Harbor Wharf, including one-story angle smith shop, 60 x 165 ft.; riggers' shop, 32 x 60 ft.; template shop, 22 x 60 ft.; second-story addition to present shop, 28 x 60 ft., and one-story woodworking shop, 39 x 70 ft.

The Standard Equipment Co., Los Angeles, has filed notice of organization to manufacture machinery and tools for bakers, etc. M. A. Bley, 3953 South Vermont Avenue, is president.

T. M. Daniels, Redondo Beach, Cal., is planning a local plant for the manufacture of a patented nut-tapping machine. The machine is being manufactured at Montrose, Col.

The Washington Iron Works, manufacturer of iron plumbers' ware, etc., 1924 Sacramento Street, Los Angeles, has awarded a contract to Houghton & Anderson, Los Angeles, for a one-story addition.

The California Peach Growers, Inc., Fresno, Cal., has broken ground for a new box manufacturing plant to cost about \$25,000. It is also planning for a new sawmill and lumber plant.

A new boiler plant to cost \$25,000 will be constructed by the Union Oil Co., Union Oil Building, Los Angeles.

Electric pumping and other machinery will be installed in the plants to be established by the Colusa Land & Water Co., San Francisco, on the Sacramento River, in Colusa County, at an estimated cost of \$220,000.

The Forscher Dual Frame Truck Co., Los Angeles, has leased property at 2145 Bay Street, for a plant for the manufacture of automobile trucks.

The San Diego Shipbuilding Co., San Diego, Cal., has been organized to take over the works of the United States Steel Shipbuilding Co., partially completed. It is proposed to commence immediate work for the completion of the plant, including shop buildings, riveting works, erecting shop and other structures. John Parkinson and George A. Hart, Los Angeles, and Frederick Jewell, San Diego, are the incorporators.

The Eagle Radiator Mfg. Co., Los Angeles, has been incorporated, with a capital of \$25,000, by L. F. Clausing, W. W. Van Deusen and F. J. Durrell, Los Angeles.

The Doheny-Pacific Oil Co., Los Angeles, is planning the construction of a new refining works in the Casmalia field, near Santa Maria, to cost about \$75,000.

The Pacific Northwest

SEATTLE, WASH., June 4.

Foundries in this section, and particularly in Oregon, are facing a serious shortage of raw materials and an appeal has been made to the Government to assist in supplying this need. It is stated that the shortage if continued will tend to hold up the completion of ships. Orders from shipyards are being booked in such volume as to insure the operation of all foundries to capacity for an indefinite period.

Recent Government awards to Seattle shipbuilders total more than \$31,000,000.

New business booked by lumber manufacturers of western Oregon and western Washington the past week was the greatest for any single week in more than six months.

The plant of the Clear Lake Lumber Co., Clear Lake, Wash., was recently destroyed by fire with a loss of more than \$400,000. Rebuilding will be undertaken immediately.

The Decatur Island Company, Port Townsend, Wash., headed by W. J. Hewitt, is constructing a kelp production plant on Decatur Island.

The International Shipbuilding Co., Columbia City, will immediately complete its wooden shipbuilding plant, started some months ago. One set of ways had been built and four more will be added.

The Vulcan Mfg. Co., Seattle, recently taken over by Frank Waterhouse Co., has secured contract from the Skinner & Eddy Corporation for building 30 anchor and 500 cargo winches. The facilities of the plant will be increased.

The Grant-Smith-Porter Co., Aberdeen, Wash., plans to lengthen its launching ways and install new machinery to increase its facilities for constructing Dougherty ships. A new machine shop, 75 x 150 ft., will be built.

The Oregon Brass Works, Portland, will establish a second unit of its plant at Front and Flanders streets, to provide for the rapid increase of business.

The Beaver Cove Lumber & Pulp Co., Ltd., Vancouver, B. C., has started preliminary work on the proposed pulp and lumber mill at Beaver Cove, B. C., at a cost of between \$3,000,000 and \$4,000,000. It will have daily capacity of 41 tons of pulp and 100,000 ft. of lumber.

The Paquet Concrete Shipbuilding Co., Portland, has been organized by Joseph Paquet, Julius Black and George N. Black and will immediately take up with the Government the establishment of a plant in Portland.

Guy Roberts, Toledo, Ore., will construct sawmill to have a daily capacity of 50,000 ft.

The Yaquina Bay Railroad & Lumber Co., Toledo, Ore., will equip a sawmill with a daily capacity of 100,000 ft.

The Columbia River Shipbuilding Corporation, Vancouver, Wash., recently received orders for 14 8800-ton steel steamers, to cost \$25,000,000. It will install two additional ways, and make other extensions to the plant.

The plant of the Manley-Moore Lumber Co., Fairfax, Wash., was recently damaged by fire to the extent of \$100,000. Most of the loss was to the machinery.

The Washington Tire & Rubber Co., Spokane, Wash., has acquired a site on which it will erect a plant, the main building to be 100 x 300 ft.

The Skinner & Eddy Corporation, Seattle, recently leased the property of the Standard Boiler Works, located between the old Skinner & Eddy property and the Seattle Construction & Dry Dock Co., which will co-ordinate the two plants and provide an additional space of 60 x 160 ft. The Standard Boiler Works has moved its plant to a new site.

The plant of the Northwestern Lumber Co., Hoquiam, Wash., which was recently destroyed by fire with a loss of \$150,000, will immediately be rebuilt. Thorpe Babcock is superintendent.

Canada

TORONTO, June 8.

Shipbuilding on a large scale will be undertaken at Halifax, N. S., as the result of an arrangement announced by Hon. C. C. Ballantyne, Minister of Marine, Ottawa. The present dry dock at Halifax, which was slightly damaged by the explosion last winter, has been acquired by the Government, and will be equipped for repairing ships of the largest size. The property immediately adjoining the dry dock has been taken over by the new shipbuilding enterprise, to be known as the Halifax Shipbuilders, Ltd. Three berths will be built, on which ships of approximately 10,000 tons will be constructed. Plans and specifications for the first three ships are being prepared, and keels will be laid as soon as the ways are ready to receive them. The first of these ships, which will be the largest hitherto built in Canada, is expected to be ready for commission in about 15 months. The principals in the new enterprise are James Carruthers and J. W. Norcross of the Canada Steamship Lines, Ltd., and R. M. Wolvin, president Montreal Transportation Co. The plant will cost between \$3,000,000 and \$4,000,000. The only assistance the Government is giving is the placing of a limited number of contracts at fixed prices for the construction of steel freighters of about 10,000 tons capacity. At a special meeting of the Halifax City Council it was decided to grant tax exemptions to the new shipbuilding company. It is expected that when the plant is running at capacity between 3000 and 4000 men will be employed.

The Swedish Crucible Steel Co., Windsor, Ont., is erecting an addition to its foundry, 100 x 100 ft., and a machine shop, 75 x 100 ft., of brick, steel and concrete. It will be used exclusively for the manufacture of cast-steel tractor wheels and castings for the General Motor Corporation, Pontiac, Mich. These additions will greatly increase the

capacity of the plant, and will help to meet the increasing demand for the company's product.

W. H. Westman, Chatham, Ont., has purchased the plant of the Exeter Mfg. Co., Exeter, Ont., and will move part of the machinery to Chatham, the remainder of which will be sold. The equipment acquired will be installed in the plant of the Chatham Malleable Steel Co., of which Mr. Westman is proprietor.

The St. Lawrence Welding Co., Montreal, has taken over the adjoining property on Inspector Street, which will be equipped to treble the present capacity of its plant.

The Gray Mfg. & Machine Co., 686 St. Clarens Avenue, Toronto, has commenced the erection of a two-story addition to its plant 27 x 72 ft. It will be equipped for the manufacture of lathes, thread millers, shell blasts, etc.

The Canada Forge Co., Welland, Ont., proposes to commence work at an early date on an addition to cost about \$30,000.

The Canadian Hart Wheels Co., Hamilton, Ont., will take over the property formerly occupied by the Baynes Carriage Co., and will erect an addition.

The Hamilton Brass Mfg. Co., Hamilton, will at once build a factory on Main Street West, at a cost of \$50,000. The company will carry on the business of reclaiming of brass by manufacturing brass ingots from scrap brass.

The T. McAvity & Sons, Ltd., St. Johns, N. B., will build an addition 100 x 400 ft. to its plant on the Marsh Road, to be used as a molding shop.

Darling Brothers, Ottawa Street, Montreal, have broken ground for the erection of a foundry to cost \$60,000.

Peacock Brothers, Montreal, have acquired a two-story brick building on Delorimer Street, and will install equipment for the manufacture of Weir pumps.

The McKinnon Industries, Ltd., St. Catharines, Ont., is in the market for a Landis bolt-threading machine $\frac{1}{4}$ to 1-in. capacity.

The City Council, Hamilton, Ont., will receive bids until June 17 for pumping equipment for the water-works plant. S. H. Kent is clerk.

The P. Lyall & Sons Construction Co., 701 Transportation Building, Montreal, will build a one-story brick forge shop on Notre Dame Street East, to cost \$40,000.

Lymburners, Ltd., 360 St. Paul Street East, Montreal, which recently awarded the contract for the erection of an addition to its shell factory, is in the market for equipment.

The Lake Lumber Co., Burnaby Lake, Vancouver, B. C., will build a lumber mill at Qualicum Beach, B. C., to cost \$60,000. Mr. Johnson is manager.

The Gutta Percha Rubber Co., 4 Yonge Street, Toronto, will build a factory on O'Hara Avenue, to cost \$10,000.

The W. J. Gage Co., manufacturer of office supplies, etc., 84 Spadina Ave., Toronto, will build an addition to its factory, to cost \$15,000. H. H. Love is superintendent.

The Massey-Harris Co., manufacturer of farm implements, machinery, etc., Toronto, will build a plant on King Street West, Toronto, to cost about \$60,000.

Bids are being received by the architect, George C. Briggs, 27 Wellington Street East, Toronto, for the erection of a one-story brick and mill addition to the plant of the Universal Tool Steel Co., 159 Dufferin Street, to cost about \$45,000.

Thomas Essery, Confederation Life Building, Toronto, will build a machine shop on Davenport Road, to cost \$20,000.

The Town Council, Truro, N. S., is making preparations for the erection of an electric plant to cost \$40,000. H. McDougall is clerk.

Fire which broke out in the foundry of R. J. Black & Son, Welland Avenue, St. Catharines, Ont., June 7, destroyed the molding shop and a number of valuable patterns. The loss is estimated at \$40,000.

The Dim-Rite Specialties, Ltd., Welland, Ont., has been incorporated, with a capital stock of \$60,000, by William H. Honsberger, George C. Brown, Jay C. Diffin, and others, to manufacture motor accessories, machinery, etc.

The Motor-Boat Controls, Ltd., Hamilton, Ont., has been incorporated, with a capital stock of \$50,000, by Edwin T. Emerson and James Sinclair, Freeman, Ont.; Eric Wilson and George T. Smith, Hamilton; and others, to manufacture motors, engines, accessories, boats, etc.

The Union Engine & Machine Works, Ltd., Montreal, has been incorporated, with a capital stock of \$150,000, by George B. Jones, Griffith L. Williams, Joseph P. Kenny, and others, to manufacture machinery, engines, etc.